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**DEPARTMENT OF THE NAVY  
JUSTIFICATION OF ESTIMATES  
FOR FISCAL YEAR 1986**



**SUBMITTED TO CONGRESS FEBRUARY 1985**

**PROCUREMENT**

**AIRCRAFT PROCUREMENT, NAVY**

JUN 28 1985

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Department of the Navy  
Aircraft Procurement, Navy  
Justification of Estimates for Fiscal Year 1986 and Fiscal Year 1987

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## AIRCRAFT PROCUREMENT, NAVY

For construction, procurement, production, modification, and modernization of aircraft, equipment including ordnance, spare parts, and accessories therefor; specialized equipment; expansion of public and private plants, including the land necessary therefor, and such lands and interests therein, may be acquired, and construction prosecuted thereon prior to approval of title; and procurement and installation of equipment, appliances, and machine tools in public and private plants; reserve plant and Government and contractor-owned equipment layaway; [\$10,903,798,000, of which \$36,120,000 shall be available for the purchase of CH/MH-53E heavy lift helicopters under a multiyear contract.] \$12,062,600,000 to remain available for obligation until September 30, [1987] 1988. (10 U.S.C. 5012, 5031, 7201, 7341; Department of Defense Appropriation Act, 1985, as included in Public Law 98-473; additional authorizing legislation to be proposed.)

### Financing

The FY 1986 budget plan of \$12,062,600,000 for the Aircraft Procurement, Navy appropriation is to be financed by new obligational authority. The FY 1987 authorization plan of \$13,487,430,000 will also be financed by new obligation authority.

Aircraft Procurement, Navy  
Program and Financing (in Thousands of dollars)

Identification code	17-1506-0-1-051	Budget Plan (amounts for PROCUREMENT actions programmed)			Collections		
		1984 actual	1985 est.	1986 est.	1984 actual	1985 est.	1986 est.
Program by activities:							
Direct program:							
00 0101	Combat aircraft	5,992,652	6,501,660	7,048,040	6,164,992	6,439,359	7,070,709
00 0201	Airlift aircraft	182,000	246,208	197,003	188,526	240,793	205,031
00 0301	Trainer aircraft	53,132	141,160	165,104	30,555	58,218	170,777
00 0401	Other aircraft	163,066	86,900	458,400	173,773	72,189	299,330
00 0501	Modification of aircraft	1,384,202	1,711,763	1,865,717	1,140,148	1,916,370	1,706,523
00 0601	Aircraft spares and repair parts	1,939,428	1,534,496	1,463,662	1,727,662	1,694,333	1,627,923
00 0701	Aircraft support equipment and facilities	431,128	681,613	864,674	392,265	621,269	812,537
00 9101	Total direct program	10,157,608	10,903,798	12,062,600	9,837,821	11,046,531	11,792,830
01 0101	Reimbursable program	42,061	8,000	5,000	18,476	62,158	7,200
10 0001	Total	10,199,669	10,911,798	12,067,600	9,856,297	11,108,689	11,800,030
Financing:							
Offsetting collections from:							
11 0001	Federal funds(-)	-28,103	-6,000	-3,500	-29,482	-6,000	-3,500
13 0001	Trust funds(-)	-13,923	-2,000	-1,000	-13,940	-2,000	-1,000
14 0001	Non-Federal sources(-) ?	-25		-500	-24		-500
17 0001	Recovery of prior year obligations(-)				-13,265		
21 4002	Unobligated balance available, start of year.				-2,658,831	-2,688,431	-2,691,540
21 4003	For completion of prior year budget plans	-28,000			-28,000		
21 4007	Available to finance new budget plans	-128,422			37,000		
22 4001	Reprogramming from/to prior year budget plans	37,000					
22 4007	Unobligated balance transferred, net						
24 4002	Unobligated balance available, end of year:				2,888,431	2,691,540	2,959,110
25 0001	For completion of prior year budget plans	119,422			119,422		
39 0001	Unobligated balance lapsing						
	Budget authority	10,157,608	10,903,798	12,062,600	10,157,608	10,903,798	12,062,600
Budget authority:							
40 0001	Appropriation	10,174,808	10,903,798	12,062,500	10,174,608	10,903,798	12,062,600
41 0001	Transferred to other accounts(-)	-17,000			-17,000		
43 0001	Appropriation (adjusted)	10,157,608	10,903,798	12,062,600	10,157,608	10,903,798	12,062,600
Relation of obligations to outlays:							
71 0001	Obligations incurred, net				9,812,851	11,100,589	11,795,030
72 4001	Obligated balance, start of year				11,304,596	13,135,211	15,221,100
74 4001	Obligated balance, end of year				-13,125,211	-15,221,100	-16,642,230
77 0001	Adjustments in expired accounts				70,891		
78 0001	Adjustments in unexpired accounts				-13,265		
90 0001	Outlays				8,039,962	9,014,800	10,373,900



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Aircraft Procurement, Navy  
Object Classification (in Thousands of dollars)

Identification code	17-1806-0-1-051	1984 actual	1985 est.	1986 est.
Direct obligations:				
Other services:				
12.5002	Purchases from industrial funds	26,343	22,162	23,585
12.6001	Supplies and materials	1,580,497	1,662,087	1,768,925
13.1001	Equipment	8,230,981	9,362,282	10,000,319
19.9001	Total Direct obligations	9,837,821	11,046,531	11,792,830
Reimbursable obligations:				
22.6001	Supplies and materials	5,912	10,891	2,304
23.1001	Equipment	12,564	42,267	4,896
29.9001	Total Reimbursable obligations	18,476	62,158	7,200
59.9901	Total obligations	9,856,297	11,108,689	11,800,030

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Budget Activity 1: Combat Aircraft

(In Thousands)

FY 1987 Estimate - \$7,659,183  
FY 1986 Estimate - \$7,048,040  
FY 1985 Estimate - \$6,501,660  
FY 1984 Actual - \$5,992,652

Purpose and Scope of Work

Navy and Marine Corps combat aircraft are procured under this budget activity. These aircraft include fixed-wing and rotary configurations and are grouped generally into the categories of attack, fighter, and anti-submarine warfare. In addition to these general categories, aircraft which directly support combat operations in specialized missions, such as aerial assault, command and control, search and rescue, reconnaissance, observation, electronic warfare, airborne mine countermeasures, vertical onboard delivery and early warning are also procured in this budget activity. Funds are budgeted to procure fully equipped aircraft, including engines and avionics equipment, special ground support and training equipment, and technical publications.

Advance procurement funds are also included to finance long lead time effort, materials, and equipments for the following year program, as well as for multiyear procurement of the P-3C airframe.

Justification of Funds

Funds for procurement of twelve different combat aircraft models, including two attack, one fighter, one strike fighter, five helicopter, one patrol, one electronic warfare and one early warning type are either budgeted in FY 1986 or requested for authorization in FY 1987. Funds are also included in this budget request for FY 1986 advance procurement requirements for aircraft scheduled for procurement in FY 1987 and for multiyear procurement. The amounts shown below finance: (1) aircraft procurement; (2) advance procurement which is justified separately at the end of the budget activity; and (3) aircraft initial spares and repair parts which are budgeted and justified in budget activity 6.

A-6E (Attack) INTRUDER

(Dollar: in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
6	202.6	6	322.1
Procurement			
Advance Procurement	11.6		23.2
Initial Spares	9.8		45.2

The A-6E is a highly effective attack aircraft. It is equipped with the Target Recognition Attack Multiresponder (TRAM) system which gives the A-6E the capability of very accurate night/all weather delivery of nuclear and non-nuclear weapons as well as a night surveillance and identification capability. The FY 1986 request continues procurement of tactical attack aircraft for the Navy and Marine Corps. In FY 1987 authorization is requested for procurement of six aircraft, and non-recurring start up and support costs for the upgraded A-6 scheduled to commence production in FY 1988.

# EA-6B (Electronic Warfare) PROWLER

	(Dollars in Millions)			
	<u>FY 1986</u>		<u>FY 1987</u>	
	<u>Qty</u>	<u>Amt</u>	<u>Qty</u>	<u>Amt</u>
Procurement	12	446.3	12	469.5
Advance Procurement		33.0		25.0
Initial Spares		22.3		23.6

The carrier-based EA-6B is an advanced electronic warfare aircraft which provides protection to Navy strike aircraft by jamming enemy radar-controlled weapons. Twelve aircraft are requested in FY 1986, and authorization is requested for twelve more in FY 1987. This continues the procurement of modern tactical EW aircraft for the Navy and Marine Corps.

# AV-8B (Attack) HARRIER

	(Dollars in Millions)			
	<u>FY 1986</u>		<u>FY 1987</u>	
	<u>Qty</u>	<u>Amt</u>	<u>Qty</u>	<u>Amt</u>
Procurement	46	892.5	47	950.8
Advance Procurement		86.6		92.2
Initial Spares		97.6		93.0

The AV-8B is an improved vectored thrust V/STOL aircraft based on the AV-8A concept and the Pegasus II engine which has up to twice the range or payload of the older HARRIER. It combines aerodynamic improvements with a new stability augmentation system to reduce pilot workload and incorporates the Angle Rate Bombing System for increased weapon delivery accuracy, thus providing a more capable and reliable light attack aircraft. The AV-8B meets the Marine Corps' requirement for a light attack aircraft which can operate from austere forward sites in direct support of ground forces.

The FY 1986 request of \$892.5 million is for 46 aircraft, and authorization is requested for procurement of 47 aircraft in FY 1987.

# F-16A (Fighter) TOMCAT

	(Dollars in Millions)			
	<u>FY 1986</u>		<u>FY 1987</u>	
	<u>Qty</u>	<u>Amt</u>	<u>Qty</u>	<u>Amt</u>
Procurement	18	653.6	18	768.5
Advance Procurement		148.2		99.0
Initial Spares		10.6		43.0

The F-14A is a high performance, fleet air defense/air superiority fighter. It is a two-place, tandem seat, variable sweep wing, supersonic, carrier-based airborne weapons system. The F-14A has visual attack and all-weather capability to deliver PHOENIX and SPARROW missiles using the AN/AWC-9 weapons control system. It also employs the M-51 gun and SIDEWINDER missiles for close-in air-to-air combat. The FY 1986 budget request includes \$653.6 million for procurement of 18 F-14A aircraft, and authorization is requested to procure 18 aircraft in FY 1987 which will be equipped with the F-110 engine. This will continue an orderly Navy fighter modernization program and maintain fighter force levels.

#### F/A-18 (Strike Fighter) HORNET

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	84	2,493.7	102	2,831.2
Advance Procurement		268.1		329.4
Initial Spares		87.8		149.9

The F/A-18 is a single-seat, twin-engine, carrier-based, multi-mission tactical aircraft that can be configured for fighter or attack missions. Employing the SPARROW and SIDEWINDER missiles and the M-61 gun, it will be a lower cost complement to the F-14, and will be the Navy's primary fighter for tactical air power projection. The F/A-18 will replace aging F-4 and A-7 aircraft. The total programmed procurement of F/A-18 aircraft is 1,377, including 11 RDT&E aircraft. The FY 1986 budget includes \$2,493.7 million for the procurement of 84 aircraft in FY 1986, and authorization is requested to procure 102 aircraft in FY 1987.

#### C/MH-53 (Helicopter) SUPER STALLION (MYP)

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	14	260.1	14	199.8
Advance Procurement		33.3		30.9
Initial Spares		24.7		23.1

The CH-53 is a heavy transport helicopter for use by both the Marine Corps and the Navy. Marine Corps missions include the lift of heavy equipment and cargo from ship to shore in the amphibious assault, the lift of equipment and supplies during tactical operations ashore, and the tactical recovery of disabled aircraft and equipment. Navy missions include vertical onboard delivery (VOD) and Airborne Mine Countermeasures (AMCM). Production of the MH-53E variation of the CH-53 commences in FY 1985. The MH-53E will have significantly enhanced AMCM capability over the presently deployed RH-53D. AMCM-associated improvements will also enhance the aircraft's capability to perform utility and special missions by significantly increasing range and navigation capability. Several MH-developed aircraft improvements will also be incorporated in the CH version beginning in FY 1986. Budget authority is requested for 14 helicopters at a cost of \$260.1 million in FY 1986, and authorization is also requested for the procurement of 14 helicopters in FY 1987. The CH-53 airframe is a multiyear procurement, beginning with the FY 1985 advance procurement for the FY 1986 lot and continuing through FY 1989 at a savings of \$102.9 million.

# AH-1T (Helicopter) SEA COBRA

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
22	202.0	-	38.8
	16.5		3.8

Procurement  
Initial Spares

The AH-1T helicopter is an improved version of the Marine AH-1J, which incorporates an uprated twin-pack engine (T700-GE-401) for increased performance, reliability and hot day performance. It has a TOW missile capability, a 20mm nose-mounted turret gun, a wing stores armament management system for selective release of externally carried weapons and a HELFIRE missile system. The improved SEA COBRA is 58 feet in overall length and the rotor diameter is 48 feet. Maximum take-off weight is 14,000 pounds. The AH-1T mission is escort and protection of troop assault helicopters, landing zone preparation immediately prior to the arrival of assault helicopters, landing zone fire suppression during the assault phase, and fire support during ground escort operations. A total of 22 AH-1T helicopters are requested in FY 1986, and authorization of \$38.8 million is requested for additional support requirements in FY 1987.

## SH-60B (Anti-Submarine Warfare Helicopter) SEAHAWK

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
18	315.6	18	286.5
	54.9		56.9
	8.3		11.3

Procurement  
Advance Procurement  
Initial Spares

The SH-60B SEAHAWK is the air sub-system of the Light Airborne Multi-Purpose System (LAMPS) MK III ship/air weapon system. LAMPS MK III is a computer integrated ship/helicopter system that increases the effectiveness of combatants for Anti-Submarine Warfare (ASW). The helicopter provides a remote platform for deployment of sonobuoys and torpedoes, processing of acoustic and Magnetic Anomaly Detection (MAD) sensor information, and an elevated platform for radar and electronic warfare support measures (EWSM). The ship provides sensor processing, command and control, integration of LAMPS information gained from other sensors, the landing and traversing system, visual landing aid, and maintenance and support facilities for the aircraft. SH-60B secondary missions include Anti-Ship Surveillance and Targeting (ASST), search and rescue (SAR), vertical replenishment (VERTREP), medical evacuation (MEDEVAC) and communications (COMM) relay. The SH-60B carries a crew of three, approximately 2,000 lbs of mission avionics, and has provisions for sonobuoys and MK-46 torpedoes. The SH-60B has a mission gross take-off weight of about 20,000 lbs. Budget authority of \$315.6 million in FY 1986 is requested for the procurement of 18 helicopters, and authorization is requested for procurement of 18 helicopters in FY 1987.

CV ASW HELO (Helicopter)

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	-	-	7	229.1
Advance Procurement	-	30.0	-	41.3
Initial Spares	-	-	-	13.4

Funding is requested for \$30.0 million in FY 1986 for advance procurement for an upgraded aircraft carrier (CV) inner zone anti-submarine warfare helicopter which is needed to modernize aging CV assets. Authorization is requested for seven aircraft in FY 1987.

P-3C (Patrol, ORION (MYP))

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	9	329.9	0	335.1
Advance Procurement		156.6		142.7
Initial Spares		10.0		10.5

The P-3C aircraft is a land-based, four-engine, turboprop patrol aircraft. Its primary mission is anti-submarine warfare (ASW): to detect, classify, track, localize, and destroy submarines; to conduct long range barrier patrols, to escort convoys, and to conduct hunter-killer operations in all weather conditions. Secondary missions are aerial mining, maritime surveillance, shipping destruction, and intelligence collection.

The P-3C ASW systems include data processing, radar, infrared detection set (IRDS), HAKPOON, sonobuoy referencing system (SRS), electronic support measures (ESM), and magnetic anomaly detection (MAD) equipment. The tactical system includes integrated displays and an inertial doppler navigator. The central digital computer has the data handling capacity and flexibility to thoroughly integrate sensor, display, navigation, communications, and armament equipment information. Thirty-three aircraft for the P-3C program are being procured under a multiyear contract. Budget authority of \$329.9 million is requested for nine aircraft in FY 1986, as well as advance procurement funding for the multiyear procurement effort, and program authorization of \$335.1 million is requested for nine aircraft in FY 1987. It is estimated that savings of \$65.5 million will result from the use of multiyear procurement.

E-2C (Early Warning) HAWKEYE

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	6	328.4	6	334.9
Advance Procurement		31.3		33.2
Initial Spares		30.6		28.2

The E-2C is a carrier-based airborne early warning/command and control system designed for fleet air defense. Additionally, it provides the battle group commander with a strike control and surveillance capability. The E-2C has the same airframe as earlier models but is equipped with new avionics equipment, including a new radar antenna and passive detection system. This equipment provides an improved capability, including overland detection of air targets. A major feature of the system is the greatly enhanced reliability over previous models. Six E-2C aircraft at a cost of \$328.4 million are scheduled for procurement in FY 1986. Authorization is also requested for procurement of six E-2C aircraft at a cost of \$334.9 million in FY 1987.

SH-2F (Helicopter) SEASPRITE

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
6	69.9	-	6.2
	1.4		-

Procurement  
Initial Spares

The SH-2F is a two-place, twin-engine helicopter with a single main-lift rotor and anti-torque tail rotor. It is the air subsystem of the LAMPS MK I weapons system, deployed aboard FFI040 and FFI052 class frigates for anti-submarine warfare. The SH-2F has secondary missions that include SAR, MEDEVAC, and communications relay. The FY 1986 budget includes \$69.9 million for procurement of six SH-2F helicopters, and authorization of \$6.2 million is requested for additional support requirements in FY 1987.

### Advance Procurement

The FY 1986 budget request includes \$850.8 million for advance procurement of mater'ial and effort for FY 1987 and for multiyear procurement associated with the P-3C airframe. Authorization is requested for FY 1987 advance procurement requirements totalling \$893.8 million in support of FY 1988 and multiyear procurement. An itemization of the requirements follows:

(Dollars in millions) Airframe Model	FY 1987		FY 1988	
	A/C Qty	A. P. in FY 86 \$	A/C Qty	A. P. in FY 87 \$
A-6E	6	11.6	12	23.2
EA-6B	12	35.0	9	25.0
AV-8B	47	86.6	48	93.2
F-14 A/D	18	148.2	12	99.0
F/A-18	102	268.1	120	329.4
C/MH-53 (MYP)	14	33.3	14	30.9
SH-60B	18	54.9	18	56.9
CV Helo	7	30.0	24	41.3
P-3C (MYP)	9	156.6	8	142.7
RP-3D	-	-	1	12.0
F-2C	5	31.3	6	33.2

The advance procurement listed is required to ensure timely delivery of the planned FY 1986 and FY 1987 aircraft. The amounts budgeted for CFE items, engines and some major GFE items are required for long leadtime effort and material for the prime contractor and their vendors. This includes items such as castings, forgings, landing gear and production engineering requirements. For most GFE, requirements are calculated for each item of equipment, considering the planned aircraft quantity, production leadtime, and prime contractor installation leadtime (i.e., the amount of time the item is needed at the factory prior to aircraft delivery). Certain equipment, primarily avionics items, are budgeted as advance procurement to ensure meeting planned aircraft production schedules.

In addition to conventional advance procurement requirements, the P-3C advance procurement includes funds for multiyear procurement of the airframe through FY 1990. Of the advance procurement funding in FY 1987, \$105.4 million will fund FY 1987 procurement and the remaining \$51.2 million will be for FY 1988 through FY 1990.



Budget Activity 2: Airlift Aircraft

(In Thousands)

FY 1987 Estimate - \$139,787  
FY 1986 Estimate - \$197,003  
FY 1985 Estimate - \$246,206  
FY 1984 Actual - \$182,000

Purpose and Scope of Work

This budget activity provides for the procurement of fleet tactical support aircraft needed to fulfill the Navy's airlift support requirements.

Justification of Funds

The FY 1986 request of \$197.0 million is for 12 UC-12B/CX aircraft and 8 C-2A aircraft as well as advance procurement funding for the final increment of C-2A aircraft to be procured under the multiyear procurement contract In FY 1987 authorization is requested for 12 UC-12B/CX and 9 C-2A aircraft.

UC-12B/CX

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
12	26.9	12	28.6
Procurement			

The UC-12B/CX is a commercial off-the-shelf FAA type certificated aircraft. The UC-12B is a twin turbo prop aircraft weighing 12,500 lbs. with a capacity to carry 8 passengers. The CX is a larger capacity aircraft which would satisfy mid-size requirements beyond the capability of the UC-12B in a complementary role. It is not a replacement for the UC-12B. Maintenance and logistics support will be provided by the contractor for the life of type. The UC-12B/CX utility aircraft will provide administrative support to Fleet Commands, subordinate units, shore facilities and research organizations. Operational support airlift aircraft perform high priority resupply and transport of personnel to remote sites. They provide delivery of repair parts and equipment, technical, inspection and accident investigation teams to sites not serviced by other carriers. They also support range clearance, MEDEVAC, other emergency evacuation, administrative transport of personnel for training or meetings, feeder delivery of parts to transshipment sites, delivery of personnel to connect with other transportation and special courier flights. In addition to significant economic advantages, the UC-12B/CX offers improvement in efficiency and responsiveness through improved reliability, maintainability and safety over the aging utility aircraft currently in the inventory.

In FY 1985 and prior, 78 aircraft have been procured. In FY 1986 funding is requested for up to 12 aircraft while in FY 1987 authorization also is requested for up to 12 aircraft.

C-2A (Greyhound) (MYP)

	(Dollars in Millions)			
	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Procurement	8	\$134.9	9	\$111.2
Advance Procurement		35.2		-
Initial Spares		4.4		4.9

The C-2A is a twin turboprop personnel/cargo transport type aircraft, capable of all weather carrier operations. The internal payload configuration is variable, allowing combinations of passengers (28 maximum), MEDEVAC litters (12 maximum), aircraft engines, repair parts, and other high priority cargo.

The C-2 aircraft mission is to provide rapid Carrier On-board Delivery (COD) of fleet essential supplies, repair parts, and personnel to deployed carrier battle groups as required to sustain at-sea operations.

The thirty-nine aircraft for the C-2A program are being procured by a multiyear procurement contract. Budget authority for \$134.9 million is requested in FY 1986 for the fourth procurement increment of eight aircraft. In FY 1987 authorization is requested for the final increment of nine aircraft at a cost of \$111.2 million.

Advance Procurement

\$35.2 million is requested in FY 1986 for advance procurement of material and effort for multiyear procurement of the C-2 aircraft. The C-2 airframe was chosen for multiyear procurement because it satisfied selection criteria for stability of requirement, funding and configuration; confidence in cost and contractor capability; and savings to the Government.

### Budget Activity 3: Trainer Aircraft

## (In Thousands)

FY 1987	Estimate	-	\$106,896
FY 1986	Estimate	-	\$165,104
FY 1985	Estimate	-	\$141,160
FY 1984	Actual	-	\$ 63,132

## Purpose and Scope of Work

The Naval Air Training Command needs aircraft specifically designed for aircrew training in order to provide the Navy, Marine Corps, and Coast Guard with well trained and highly skilled pilots, navigators, and aircrew. Aircraft procured under Budget Activity 3 are used to train students in basic and advanced flying techniques, navigation, instrument flying and numerous other skills required before the transition to high performance fleet aircraft.

### Justification of Funds

Funds are requested in FY 1986 for procurement of twelve ADVERSARY (F-16) aircraft and thirty-eight T-34 aircraft. In FY 1987 authorization is requested for fifty T-34C aircraft and fifteen T-44A aircraft.

**T-34C (Trainer) MENTOR**

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
38	\$49.4	50	\$54.2

The T-34C is a single engine, turboprop training aircraft.

The mission of the T-34C is to train student aviators in primary flight techniques. In FY 1986 funds are requested to procure 38 T-34C aircraft. In FY 1987 authorization is requested for an additional 50 aircraft. The T-34 total program is 423 aircraft, including two procured with RDT&E funds. In FY 1985 and prior, 335 aircraft will have been procured. The balance of 88 aircraft is planned for procurement in FY 1986 and FY 1987.

ADVERSARY (F-16) Trainer

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
12	\$115.7	-	\$-
Initial Spares	14.8	-	-

The ADVERSARY (F-16) aircraft is a high-performance supersonic tactical fighter which closely replicates the operational characteristics of the latest Soviet MIG series aircraft.

ADVERSARY (F-16) aircraft will be utilized at the Navy Fighter Weapons School (TOP GUN), NAS Miramar and at VF-43, NAS Oceana. These aircraft provide accurate simulation of aggressor aircraft such as the Soviet MiG, and are used to assure that Navy fighter squadrons maintain superiority in Air Combat Maneuvering (ACM).

In FY 1986 funding in the amount of \$115.7 million is requested for the procurement of 12 ADVERSARY (F-16) trainer aircraft. Fourteen aircraft are being procured with FY 1984 and FY 1985 funding for a total approved program of 26 aircraft.

T-44A

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
-	-	15	\$26.0

Procurement

The T-44A is a light, twin engine turboprop trainer aircraft which is a military version of the Beech King Air H-90. The aircraft has provisions for two pilots, an observer and two passengers.

The T-44A is employed in the Naval Air Training Command as the advance multi-engine trainer to train student pilots for land-based patrol and transport aircraft.

Authorization is requested to procure 15 T-44A aircraft in FY 1987.

Budget Activity 4: Other Aircraft

(In Thousands)

FY 1987 Estimate - \$379,500  
FY 1986 Estimate - \$458,400  
FY 1985 Estimate - \$ 86,900  
FY 1984 Actual - \$165,066

Purpose and Scope of Work

Aircraft other than those associated with combat, airlift, and training missions are procured under Budget Activity 4.

Justification of Funds

The FY 1986 request of \$458.4 million is for 2 E-6A and 9 VH-60 aircraft as well as advance procurement for the FY 1987 E-6A program. Authorization is requested for 4 E-6A aircraft and VH-60 support in FY 1987 as well as advance procurement for the E-6A FY 1988 program.

E-6A

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
2	297.3	4	\$295.3
Procurement	58.3	-	80.0
Advance Procurement	44.6	-	35.4
Initial Spares	-	-	-

The E-6A is the replacement for the TACAMO aircraft. Its mission is to provide survivable communications connectivity between the National Command Post and fleet ballistic missile submarines. In FY 1986 \$297.3 million is requested for two E-6A aircraft. Authorization is requested for procurement of four aircraft in FY 1987. A total of fifteen aircraft is planned including one procured with RDT&E, N funds.

VH-60

(Dollars in Millions)			
FY 1986		FY 1987	
Qty	Amt	Qty	Amt
9	102.8	-	\$ 4.2
Procurement	-	-	-
Advance Procurement	25.1	-	-
Initial Spares	-	-	-

The VH-60 aircraft will replace current executive transport aircraft in the Marine Corps HXM-1 Squadron. A variant of the H-60 helicopter, the VH-60 aircraft has the necessary power, space and weight to fully accomplish the executive transport mission on a long term basis. The FY 1986 budget includes \$102.8 million for nine aircraft. In FY 1987 authorization of \$4.2 million is requested for additional support requirements.

Advance Procurement

\$58.3 million is requested in FY 1986 for advance procurement of material and effort for procurement of four E-6A aircraft in FY 1987. FY 1987 authorization of \$80.0 million advance procurement is requested for six E-6A aircraft in FY 1988.

Budget Activity 5: Modification of Aircraft

(In Thousands)

FY 1987 Estimate	- \$2,040,242
FY 1986 Estimate	- \$1,865,717
FY 1985 Estimate	- \$1,711,763
FY 1984 Actual	- \$1,384,202

Purpose and Scope of Work

The Aircraft Modification program funds incorporation of technical improvements which substantially modernize the operational capabilities; improve the maintainability, reliability, and safety; and extend the service life of aircraft which have entered the fleet. Budget estimates and authorization requests include funds for modernization/conversion programs undertaken in lieu of procurement of new aircraft in order to maintain an effective, responsive force level.

Justification of Funds

In order to fulfill inventory requirements, it has become mandatory to operate many older aircraft beyond their originally programmed service life and update their weapon systems so that they remain capable of continued effective operation in new threat environments. To accomplish these two objectives, the Navy pursues service life extension and weapons modernization programs. These conversions often involve complex engineering changes which require a major production effort and are usually accomplished at a contractor's facility, with aircraft inducted into an assembly line for the conversion/modernization programs. A substantial portion of the funds requested in FY 1986 and FY 1987 are for modifications in this category.

The FY 1986 budget request and the FY 1987 authorization request also include funds for incorporation of other modifications intended to enhance the operational capabilities of in-service aircraft or their safety-of-flight, maintainability or reliability. Only essential modifications or changes which are necessary to satisfy the most urgent operational requirements are included in this budget request.

Justification for the FY 1986 budget request and for the FY 1987 authorization is provided by a narrative summary which provides an overview of the budgeted modifications in each aircraft series. A "back-up" section containing a detailed description of most modifications in the budget request is also included. The installation cost of all FY 1980 and subsequent modification programs is budgeted in the Operations and Maintenance; Navy appropriation.

The following narrative summary highlights modification requirements by aircraft series and model.

#### A-3 Series Modification

The FY 1986 budget request and the FY 1987 authorization request include \$5.4 million and \$7.4 million, respectively, for A-3 series aircraft modifications. \$2.7 million in FY 1986 is included for procurement of new communication suite components such as the ARC-190 W radio, ARC-175/ARN-126 VHF suite and the ARC-159 UHF Radio. \$1.0 million in FY 1986 is included for improvements to the ATM oil pump and speed control governor. These improvements will significantly enhance the A-3's ability to provide hydraulic and electrical power to the weapons system. \$1.7 million in FY 1986 and \$1.5 million in FY 1987 are included for the Service Life Improvement Program (SLIP) program to extend the structural fatigue life of the A-3. The program includes identification and replacement/reinforcement of structural areas to insure continued safe operation. Authorization is requested in FY 1987 for the EA-3B Sustainability Phase II (\$5.4 million) and the Radar Altimeter Replacement (\$.5 million).

#### A-4 Series Modification

\$17.0 million in FY 1986 and \$18.7 million in FY 1987 are requested for A-4 series aircraft modifications. Continuation of the AN/ALQ-162 countermeasures program, which provides complementary Defensive Electronic Countermeasures (DECM) jamming capability with the AN/ALQ-126 Jammer, is requested (\$.1 million in FY 1986 and \$.8 million in FY 1987) to significantly increase aircraft survivability against radar-directed air defense systems. The funding included in the A-4 series provides for the purchase of airframe change kits. The systems are procured in the Common ECM equipment line. \$2.4 million in FY 1986 is requested for the AN/ARN-118 TACAN, a tactical navigation system reliability improvement. \$.7 million in FY 1986 and \$.3 million in FY 1987 are requested for the Constant Frequency Generator program to decrease maintenance and preclude shortages of this essential component. In order to consolidate and update the current air data devices being employed, \$1.6 million in FY 1986 and \$.7 million in FY 1987 are requested to procure the Digital Air Data Computer System. Incorporation of the provisions for the MAVERICK into the A-4M continues in FY 1986 (\$.5 million) and in FY 1987 (\$2.3 million).

Other continuing programs include the AN/ARC-159 Radio program, \$2.4 million in FY 1986 and \$2.5 million in FY 1987. This program will replace the aging ARC-51A with a solid state UHF transceiver to achieve improved readiness and reduced maintenance costs. In a similar effort, \$2.6 million and \$2.3 million in FY 1986 and FY 1987, respectively, are requested for the AN/APN-194 Altimeter modification. A six-fold decrease in mean flight hours before failure (MFHBF) will be obtained by incorporating this improved unit. AN/AJB-3 All Attitude Heading Reference System reliability improvements are budgeted in FY 1986 (\$1.1 million) and FY 1987 (\$2.3 million). Incorporation of updated parts and subassemblies will significantly improve system reliability. \$.5 million in FY 1986 and \$.3 million in FY 1987 are requested for AN/APR-43 airframe change provisions. Like the AN/ALQ-162, the AN/APR-43 systems are budgeted in the Common ECM equipment line. The final program budgeted in FY 1986 is the Pilot Restraint System Improvement (\$.1 million in FY 1986 and \$.6 million in FY 1987). Authorization is requested for the Engine Omnibus Change Modification (\$.6 million in FY 1987).



#### A-6 Series Modification

A total of \$240.5 million in FY 1986 and \$228.4 million in FY 1987 is requested for various A-6 modifications. Paramount among them is the Target Recognition and Attack Multisensor (TRAM). The TRAM program provides the A-6E with improved capability for location and surveillance of opposing Naval Forces and countering of their operations during periods of darkness, allowing maximum night identification and 24-hour strike capability. The system includes a passive imaging infrared sensor and a laser search set located in a 20-inch diameter, space stabilized turret. \$65.2 million in FY 1986 and \$58.4 million in FY 1987 are requested for TRAM equipment procurement on a multiyear production basis.

\$46.9 million in FY 1986 is requested to continue procurement of the AN/ASN-92 (V) (CAINS) Inertial Measurement Unit, mount, and Power Supply Unit (PSU) to achieve significantly higher reliability over the present AN/ASN-31 Inertial Navigation System which is being phased out of production. Completion of the Vertical Display Indicator modification is included in the FY 1986 budget request; essentially a reliability improvement, \$8.9 million in FY 1986 is requested.

Other significant on-going programs include the A-6E Weapon Control System Improvement and the KA-6D R&M Update. The Weapon Control System Improvement will simplify and consolidate weapon control system configurations by modifying the aircraft's 4 PI computer with a double density memory capability, thus providing the additional capacity required for successful operation of all current weapons (SIDEWINDER, WALLEYE, etc.). The FY 1986 budget request includes \$11.9 million in FY 1986 and \$8.5 million in FY 1987 for this program. \$18.5 million in FY 1986 and \$12.8 million in FY 1987 are requested to proceed with the KA-6D R&M Update Modification. This program will bring the configuration of older tankers, A-6As converted to KA-6Ds under a previous modification, up to the latest configuration as well as incorporate improvements to increase reliability and maintainability. Another continuing program, the A-6E Weapons Integration, will provide increased capability and compatibility and will simplify incorporation of new weapons and avionics systems projected for the A-6E. The FY 1986 budget request and FY 1987 authorization request includes \$25.6 million and \$26.8 million, respectively, for this effort. \$6.8 million in FY 1986 is requested for Radar Data Converter Improvements, a modification that will incorporate modern, digital RDC to significantly increase flight safety. The program completes in FY 1987 and \$6.3 million is included for this purpose. Funding for the AN/ALR-67 is included in the FY 1986 request (\$2.2 million in FY 1986 and \$2.1 million in FY 1987). The AN/ALR-67 Radar Receiving Set, Countermeasures Warning and Control System will provide detection and direction finding (DF) coverage over the entire known radar/missile frequency bands for all types of emissions used for target tracking and missile control. The AN/ALR-67 system is budgeted in the Common ECM equipment line; the A-6 series funds referenced will procure the airframe change provisions necessary to incorporate this important radar receiving set. Integration of the MAVERICK missile series will provide A-6E aircraft with improved close air support and discrete target capability. \$7.7 million in FY 1986 and \$4.3 million in FY 1987 are requested to continue this modification.

Five new starts are requested in FY 1986. Largest among them, HARM missile integration, will provide an improved anti-radiation missile for A-6E TRAM configured aircraft. Providing additional stand-off range and self-protection capability, \$22.5 million and \$22.6 million in FY 1986 and FY 1987, respectively, are requested. Water intrusion problems causing corrosion and system failure will be corrected in the FLAP/SLAT System Improvement (\$6.9 million in FY 1986 and \$4.7 million in FY 1987). In addition to reducing the water intrusion problem, the modification will also simplify

#### A-6 Series Modification cont'd

maintenance. \$6.6 million in FY 1986 and \$8.0 million in FY 1987 are requested for the Digital Fuel Quantity modification. Incorporation of a new fuel quantity indicator will provide increased accuracy and improved reliability and maintainability. The objective of the Survivability and Vulnerability program, for which \$6.8 million in FY 1986 and \$2.1 million in FY 1987 are requested, is to minimize potential fire hazards in the engine bays, topdeck/birdcage areas, and in the fuselage/wing void areas. A fire extinguishing system, bleed air detection systems and incorporation of interlocking rigid foam filler blocks are among the modifications necessary to reduce fire hazards. Finally, to provide for the use of enhanced WALLEYE II pods on A-6E aircraft, \$4.0 million in FY 1986 and \$9.7 million in FY 1987 are requested for the Stand-off Air-to-Ground Weapons modification.

Authorization for two continuing and six new start programs are requested in FY 1987. \$40.2 million in FY 1987 is requested for Rewing/SUEP pods. Heavy wing loadings and high-G maneuvers have accelerated the service life completions of older A-6E aircraft necessitating the program. The AN/AAS-33 TSP III Access Cover is a maintenance improvement for which \$5.4 million is requested in FY 1987. New starts in FY 1987 include \$6.6 million for the Global Positioning System for KA-6D aircraft, \$4.7 million for the Analog to Digital Converter modification, \$4.4 million for the AN/ARC-182 Radio for A-6E, \$4.8 million for the AN/ARC-182 Radio for KA-6D aircraft, \$1.7 million for the Anti-Skid Brake Control System, and lastly, \$1.3 million for a Fire Protection System.

#### EA-6 Series Modification

In the FY 1986 budget request and FY 1987 authorization request, \$45.4 million and \$75.7 million respectively, are included for EA-6 modifications. Among the most significant EA-6 modifications, budgeted at \$20.8 million in FY 1986 and \$41.7 million in FY 1987, is the ALQ-99 pods modification. This modification consists of the refurbishment of existing pods and the purchase of additional ALQ-99 jammer pods. Refurbishment of existing pods will lessen significantly the damage to pod components which occurs due to circuitry malfunction, while additional pods are required to support increased aircraft inventories.

Included in the FY 1986 budget request and FY 1987 authorization request are \$14.6 million and \$12.6 million respectively, for the CAP 1 Update Program. This effort will replace the current head-reckoning Doppler navigation system to provide the necessary accuracy required for effective employment of the EA-6B weapons system and by doing so, will measurably enhance reliability, improve readiness, and demonstrably lessen life cycle cost. Also incorporated under the auspices of this program are the AN/ASN-123 Signal Data Converter, a more reliable unit currently installed in production EA-6B aircraft and the AN/AYK-14 computer.

Two modification programs will be completed in FY 1986, the EA-6A AN/APS-130 and Navigation Update (\$5.4 million) and the ALQ-76/86 Update (\$1.4 million). The APS-130 and Navigation Update for the EA-6A will replace the outmoded APQ-103 radar group and will increase maintainability as well as provide commonality between A-6E/EA-6B radar. Goals of the ALQ-76/86 Update program include increased reliability and maintainability, increased jammer power output (ALQ-76). Increased receiver clarity (ALQ-86), and overall greater ease of operation.

#### EA-6 Series Modification cont'd

Another continuing modification is the Fire Protection System (\$2.2 million in FY 1986 and \$1.3 million in FY 1987). Initiated in FY 1985, potential fire hazards are being corrected through the incorporation of a fire extinguishing system and bleed air leak detection systems. \$.8 million in FY 1986 is requested for the EA-6B Structural Improvement effort. Designed to increase the number of catapults and arrestments for selected EA-6B aircraft, a follow-on procurement is requested in FY 1987 (\$2.0 million). Finally, \$.2 million is requested in FY 1986 and \$.4 million in FY 1987 to initiate the Strobe Lights Safety modification.

Authorization is requested for the following FY 1987 new starts: \$4.3 million for the AN/ARC-182 UHF/VHF Radio; \$4.5 million for the ARC-199 HF Radio; \$2.5 million for the Digital Recorder System, \$3.3 million to procure a new Digital Fuel Quantity System; \$2.5 million for the CIU/Encoder Update; and lastly, \$.6 million for KY-75 airframe provisions.

#### A-7 Series Modification

For various modifications to A-7 Series aircraft, \$30.0 million in FY 1986 and \$24.6 million in FY 1987 are requested. Of the total program, \$18.8 million in FY 1986 is requested to complete the TF-41 HELP modification. The TF-41 Engine Hot Section Extended Life Program (HELP) will incorporate redesigned hot section and control components to improve operational readiness, reduce turbine failure, and minimize the cost of ownership.

Additionally, \$5.0 million in FY 1986 and \$4.6 million in FY 1987 are requested for the AN/ALQ-162 Countermeasures Set. Working in conjunction with the AN/APR-43 Radar Warning Receiver, the AN/ALQ-162 provides complementary DECM jamming capability to the operational AN/ALQ-126 DECM Jammer installed on tactical aircraft. The addition of the AN/ALQ-162 will result in a significant increase in the survivability for Navy tactical aircraft against radar-directed air defense systems.

\$4.0 million in FY 1986 and \$20.0 million in FY 1987 are requested for the Aircraft Rewire modification. This wiring update will incorporate state-of-the-art improvements in wire composition insulation, terminations, connectors and improved shielding. The instrument panel wiring installation will be modified and upgraded to allow for future changes and additional circuits as well.

Finally, \$.7 million is requested in FY 1986 to complete the Hydraulic Extension Units modification, and \$1.5 million in FY 1986 is requested for the Fuselage Bulkhead Reinforcement safety and reliability improvement.

#### AV-8 Series Modification

Of the \$8.1 million and \$7.9 million requested for AV-8 modifications in FY 1986 and FY 1987, respectively, the majority of the funding is requested to continue the Digital Engine Control System program (\$5.8 million in FY 1986 and \$6.1 million in FY 1987). The modification will procure a digital engine control system to replace the current hydro-mechanical fuel control and will provide the necessary structural and systems changes to accommodate it.

#### AV-8 Series Modification cont'd

The balance of the FY 1986 request is for the Engine Monitor System (\$2.3 million in FY 1986 and \$.4 million in FY 1987). A safety modification, the system will warn the pilot of engine problems, document engine stalls or operating limitation breaches, and track engine operational usage cycles.

Authorization is requested for one new modification in FY 1987, the Surge Margin Improvement (\$1.4 million).

#### F-4 Series Modification

In the FY 1986 budget request and FY 1987 authorization request, \$5.0 million and \$1.9 million respectively are identified for F-4 series modifications. The largest amount requested, \$2.1 million in FY 1986, is for the Follow on Structural Fatigue program. As its title implies, this modification will replace selected fatigue-sensitive components to ensure safety-of-flight. \$1.9 million is requested in FY 1987 to continue this effort. Other modifications include airframe provisions for the AN/APR-43 Radar Warning Receiver (\$1.8 million in FY 1986) and the AN/ALQ-162 (\$1.1 million in FY 1986). Both systems are budgeted in the Common ECM equipment line.

#### RF-4 Series Modification

\$2.5 million in FY 1986 and \$2.0 million in FY 1987 are requested for RF-4 series modification. The largest program is the Follow On Structural Fatigue effort for which \$1.2 million and \$.6 million are budgeted in FY 1986 and FY 1987, respectively. By correcting known structural deficiencies, this modification will ensure that the RF-4B aircraft remains a safe, viable weapon system for the remainder of its service life. Funding for airframe change provisions for the AN/ALQ-162 is \$.9 million in FY 1986 and \$1.0 million FY 1987 and for the AN/APR-43 is \$.4 million each in FY 1986 and FY 1987. Both the AN/ALQ-162, which provides complementary jamming capability to the existing AN/ALQ-126, and the AN/APR-43 system, an update to the current AN/ALR-45(V) and AN/ALR-50(V) are budgeted within the Common ECM equipment line.

#### F-14 Series Modification

Budget authority of \$158.8 million in FY 1986 and authorization of \$165.3 million in FY 1987 are requested for F-14 modification programs. Of major importance is the TF-30 Engine Improvement package budgeted at \$57.3 million in FY 1986 and \$34.9 million in FY 1987. Because the F-14A aircraft has demonstrated greater-than-expected capability, the present engine has been exposed to a more demanding environment than envisioned. As a result, the shortcomings of the engine have been revealed and have had a significant detrimental effect on the operational readiness of the aircraft. To alleviate the situation, this program will redesign and replace engine components to achieve improved durability, reliability, and maintainability.

F-14 Series Modification cont'd

Other significant ongoing modifications budgeted within the F-14 series are the Main Landing Gear and the Structural Improvements programs. The Main Landing Gear modification will increase the inner piston wall thickness to eliminate premature cracking and failures. \$17.0 million in FY 1986 and \$18.7 million in FY 1987 are identified for this purpose. Various deficiencies identified during aircraft fatigue tests will be corrected in an omnibus modification program entitled Structural Improvements. Embracing sixteen separate modifications, \$48.4 million in FY 1986 and \$64.6 million in FY 1987 are requested. Another reliability and maintainability program, the Structural Fatigue modification is included in the FY 1986 submission, and \$7.0 million in FY 1986 and \$3.6 million in FY 1987 are requested. Predecessor and companion to the larger Structural Improvements program, the Structural Fatigue modification corrects bulkhead cracking by the addition of interference fit fasteners and new door stop angles and plates as well as by replacing the existing upper and lower torque arm pins on the main landing gear. The Wiring Upgrade modification continues the replacement of "Poly-X" wiring and corroded connectors with more deterioration-resistant HAIAR wire and cadmium connectors, and \$1.7 million and \$1.8 million are requested in FY 1986 and FY 1987 respectively. \$5.4 million in FY 1986 and \$5.6 million in FY 1987 are requested for Weapons Rails Operational Improvements. Water and cleaning solution intrusion, wiring insulation and connector breakdowns, unsatisfactory fasteners, and mechanical linkage problems have all contributed to the deterioration of the weapons rails. Without modification or replacement of the affected components, PHOENIX capability will be compromised. \$1.1 million in FY 1986 and \$1.2 million in FY 1987 will be necessary to continue the Vertical Fin Structure reliability modification, a program which replaces aft nacelle frames and brackets. Smaller reliability and maintainability modifications which are included in the FY 1986 request are the ongoing Wing Pivot Bearing Redesign (\$.8 million each in FY 1986 and FY 1987), the Gun Redesign (\$.2 million in FY 1986 and \$.2 million in FY 1987), the Rain Removal Valve and Correction of Defects programs which together total \$.1 million in FY 1986 and \$.1 million in FY 1987, and the Hydraulic System Cavitation Damper program which completes in FY 1986 (\$.14 million).

Several safety modifications are budgeted in FY 1986. While the funding associated with these changes may not appear significant, these programs are essential to safe, effective operations of F-14 aircraft. Modifications included in this category are the Gun Gas Purge Door (\$.11 million in FY 1986 and \$.6 million in FY 1987), the ECS Turbine Compressor Assembly (\$.3 million in FY 1986 and \$.1 million in FY 1987), and the Fire Warning System (\$.2 million in FY 1986).

\$4.4 million in FY 1986 and \$13.4 million in FY 1987 are requested for the Secure LINK-4A program. An operational capability enhancement, this modification will provide anti-jam protection for the LINK-4A, the digital link used for target data exchange between E-2 and F-14A aircraft. Two other capability improvements complete in FY 1986. The Television Camera Sight Unit (TCS) will provide the pilot and radar intercept officer (RIO) with the ability to visually identify airborne targets at long stand-off ranges during day clear weather conditions. \$.9 million is requested for this program. Finally, \$.1 million is requested for the Activate Spoiler to 62 degree effort.

The principal new start in FY 1986 is the MXU-611 Jettison Release program (\$3.0 million in FY 1986 and \$4.5 million in FY 1987). This modification will minimize the risk of cartridge blow out due to inadvertent locked-shut firing of the MXU-611 by modifying the system design to include electrical safing. Two other new starts are the Blanker Compatibility

#### F-14 Series Modification cont'd

with ALQ-126B modification to facilitate interoperability of the AN/ALR-45 radar warning receiver and the AN/ALQ-126B (\$1.0 million in FY 1986 and \$.9 million in FY 1987) and the ECS Blced Duct (\$.4 million in FY 1986 and \$.3 million in FY 1987).

Authorization in FY 1987 is requested for the AN/ARC-182 Radio (\$13.3 million), AN/ALE-39 modification (\$.4 million) and the AN/AWG-9 Transmitter-GTWT Modulator (\$.3 million).

#### F-8 Series Modification

\$1.1 million in FY 1986 and \$.1 million in FY 1987 are requested for the RF-8G Configuration Update.

#### F-5 Series Modification

Funding for only one F-5 series modification is requested in FY 1986. The Structural Fatigue modification (\$1.7 million and \$1.0 million in FY 1986 and FY 1987, respectively) will replace or correct known fatigue-sensitive structural components.

#### OV-10 Series Modification

OV-10 Series modifications account for \$51.5 million and \$55.1 million of the total FY 1986 budget request and FY 1987 authorization request, respectively. \$41.5 million in FY 1986 and \$35.1 million in FY 1987 are requested to continue the OV-10 A to D Conversion effort which will bring those OV-10's that were not converted previously up to the latest configuration. Once modified, the OV-10D (NOS) aircraft provides the capability to locate enemy troops, artillery positions and armor under conditions of low visibility, night and masking. Additionally, the 30 aircraft to be updated will receive service life extension modifications. Those aircraft that were converted to the OV-10D configuration previously require structural improvements to extend their service life as well. To ensure that these aircraft will remain effective mission assets into the late 1990's, \$8.6 million in FY 1986 and \$16.2 million in FY 1987 are requested for the OV-10D Service Life Extension program. \$1.4 million in FY 1986 and \$1.3 million in FY 1987 are requested for the Position Location Reporting System (PLRS), a system that will allow battlefield commanders to monitor the location of OV-10 aircraft. Finally, authorization is requested for one FY 1987 program, the Give-Take Ejection Seat safety modification (\$2.5 million).

#### F-18 Series Modification

Included in the FY 1986 budget request and FY 1987 authorization request are \$17.8 million and \$106.5 million, respectively, for F-18 series modifications. \$6.7 in FY 1986 and \$6.6 million in FY 1987 are requested for Correction of Discrepancies in delivered F-18 aircraft which will update these aircraft to the present configuration of in-production aircraft. Also continuing in FY 1986 is the Special Weapons program which will correct and improve the aircraft monitor and control system (\$1.1 million in FY 1986 and \$.6 million in FY 1987).

#### F-18 Series Modification cont'd

Two new programs will begin in FY 1986. The OMNIBUS Weapons update, \$7.8 million in FY 1986 and \$12.9 million in FY 1987 will ensure aircraft compatibility with the new, enhanced or existing but unaddressed weapons which are, or will be, in the U.S./USMC weapons inventory. So that the on-board avionics of the F-18 are compatible with the new AN/ALQ-126B electronic countermeasures system, minor filter and software modifications must be incorporated; therefore, \$2.2 million in FY 1986 and \$1.5 million in FY 1987 are budgeted for the AN/ALQ-126B Provisions program.

Authorization to initiate seven new programs in FY 1987 is requested. Most significant is the AN/ALQ-165 (ASPJ) program for which \$56.9 million is requested. The AN/ALQ-165 is a versatile defensive countermeasures system consisting of receiver, processor and transmitter units, which will fit in the space currently occupied by the AN/ALQ-126. Once incorporated, it will provide combat survivability against modern, diversified radar controlled weapons. System flexibility is assured through reprogramming capability which will permit the system to respond to future threats. The Modified Leading Edge Extension (LEX) program will incorporate an equipment bay to accommodate the HARM Command Launch Computer and related equipments and \$7.9 million is requested for the program. \$7.6 million is requested for the Flight Incident Recorder and Aircraft Monitor System (FIRAMS). A functional replacement for the AN/ASM-612 Signal Data Recording Set, the AEU-12/A Engine Performance Indicator, the mechanical clock, and the Fuel Quantity Indicator, the system will add a deployable Flight Incident Recorder, JTIDS data initialization, and fuel system fault isolation capability. The Laser Target Designator (\$5.7 million) modification will augment the AN/AAS-38 Detecting Set currently in use. An essential system for laser-guided bomb/laser-guided missile delivery in high threat environments, it will also improve aircraft maneuverability and delivery flexibility. Other new starts in FY 1987 include the Environmental Control System (\$2.3 million), the Automatic Wing Fuel Recirculation modification (\$1.5 million) and the Beacon Bombing program (\$1.0 million).

#### H-46 Series Modification

\$137.0 million in FY 1986 and \$122.3 million in FY 1987 are requested for various H-46 modifications. The most significant H-46 program, the Safety, Reliability and Maintainability (S,R&M) Update, will require \$115.5 million in FY 1986 and \$9.5 million in FY 1987. Current planning calls for the use of H-46 series aircraft through the mid-1990s. Needed corrective action must be performed on these aging aircraft to ensure safety, maintain fleet readiness, and avoid exorbitant cost of ownership. Planned modifications involve changes to ensure the adequacy of the basic airframe structure as well as improvements to various system components to increase reliability and maintainability.

The Engine Air Particle Separators modification will retrofit a flight-proven erosion protection system that will provide a near term solution to foreign object damage. To continue this program, \$8.1 million in FY 1986 and \$13.0 million in FY 1987 are requested. \$4.0 million in FY 1986 and \$10.5 million in FY 1987 are requested for Night Vision modifications. This program will provide the appropriate equipment to permit low altitude helicopter operations in 25 to 75 percent of night conditions. Two other continuing programs are included in the FY 1986 request: the Engine Condition Control System (\$2.4 million in FY 1986 and \$2.5 million in FY 1987), a safety improvement which will incorporate new engine condition actuators, and the AN/APN-233 Radar Navigation System (\$2.4 million and \$6.9 million in FY 1986 and FY 1987, respectively), a light weight, self-contained system selected for use on the C-2A and OV-10D aircraft.

#### H-46 Series Modification cont'd

Two safety modifications are scheduled to begin in FY 1986. \$3.3 million in FY 1986 and \$2.8 million in FY 1987 are requested for the Emergency Flotation System which, through the use of polyurethane flotation bags inflated manually or upon water entry, will allow the helicopter to remain afloat and upright for up to 5 hours. Additionally, \$1.4 million in FY 1986 and \$3.8 million in FY 1987 are requested for Crashworthy Pilot Seats. By incorporating energy attenuating seats, crash survivability will be significantly enhanced. Therefore, the program will substantially reduce the number of major and total injuries currently being sustained in helicopter operations.

Programs commencing in FY 1987 for which authorization is requested include the Attitude Heading and Reference System (AHRS) Replacement, \$4.0 million; the Ground Proximity Warning System, \$3.8 million; the Position Location Reporting System, \$2.3 million; the Hydraulic Flight Control Closet Armor modification, \$1.1 million; the Multi-Mode Receiver, \$.9 million; and the Helicopter Emergency Egress Lighting modification, \$1.2 million.

#### H-53 Series Modification

In the FY 1985 budget request and FY 1987 authorization request, \$40.3 million and \$50.8 million, respectively, are identified for H-53 modifications. \$3.4 million in FY 1986 and \$4.1 million in FY 1987 are requested for the AN/ALQ-157(V), an IR Jammer that degrades the capabilities of IR homing missiles, a serious threat to tactical helicopters against which current defenses are inadequate. Crashworthy Armored Pilot Seats will provide improved helicopter crash survivability and by doing so, save a substantial number of lives. To fund this effort, \$2.8 million in FY 1986 and \$3.9 million in FY 1987 are requested. In a similar vein, \$3.4 million and \$4.5 million are requested for the Crashworthy Fuel System which, as its name implies, will provide more impact resistant fuel tanks and flangeable fittings to contain fuel spillage in the event of impact with the ground. Another safety related modification, the Ground Proximity Warning System, is included in the FY 1986 request (\$1.7 million in FY 1986 and \$1.5 million in FY 1987). The system will provide audible and visual warning to aircrews of imminent inadvertent ground contact.

New, lightweight armor protection will significantly reduce ballistic vulnerability of the H-53 series while actually reducing weight. A modification to incorporate this armor, entitled Aircraft Survivability Improvements, is included in the FY 1986 request (\$2.7 million in FY 1986 and \$6.5 million in FY 1987). The Night Vision program will provide the appropriate equipment to permit low altitude helicopter operations in 25 to 75 percent of night conditions. \$13.9 million in FY 1986 and \$10.7 million in FY 1987 are requested. Continuation of the LTN-211 OMEGA/VLF Navigation System is requested, and \$4.1 million in FY 1986 and \$3.9 million in FY 1987 are designated for this effort in the FY 1986 submission. \$1.8 million in FY 1986 and \$1.8 million in FY 1987 are included for the Modified Main Rotor Head Damper program. The last of the continuing programs is the Selectable Strobe Lights safety change, \$1.8 million in FY 1986 and \$1.4 million in FY 1987.



#### H-53 Series Modification cont'd

The AN/ARC-182(V) VHF/UHF Radio is a solid state system is planned for incorporation in all Navy aircraft. \$3.0 million in FY 1986 and \$7.9 million are requested to begin this modification. Another new program, the Four Axis Stick Desensitizer, \$2.3 million and \$1.4 million in FY 1986 and FY 1987, respectively, is requested in the FY 1986 budget. Finally, airframe provisions for the AN/APR-39 (\$1.4 million in FY 1986 and \$4.4 million in FY 1987) are requested. The AN/APR-39 system will be procured within the Common ECM equipment line.

Authorization is requested for three programs in FY 1987: the Hydraulic Inflight Replenishment (\$1.2 million); AFCS Lateral Servo Improvement (\$2.0 million); and the Position Location and Reporting System (\$1.6 million).

#### SH-60B Series Modification

\$1.6 million in FY 1986 and \$3.8 million in FY 1987 are requested for SH-60 series modifications. In FY 1986, one modification, the EMI Filterline Wire, will correct deficiencies identified in the operation of the SH-60B in the expected fleet EMV environment. Currently incorporated in production SH-60B aircraft, \$1.6 million in FY 1986 and \$3.5 million in FY 1987 are requested. Helicopter Emergency Egress Lighting (HEEL) modifications are budgeted in FY 1987 (\$3.3 million).

#### H-1 Series Modification

The FY 1986 request, \$75.4 million, and the FY 1987 authorization request, \$95.4 million, includes funding to continue several major H-1 series modifications. \$2.6 million in FY 1986 and \$4.7 million in FY 1987 are requested for Night Vision modifications for AH-1J/T aircraft. This improved cockpit system integrated with night vision goggles will improve the tactical effectiveness of this helicopter at night and at low levels. A companion retrofit into the UH-1N community is also budgeted, \$5.7 million in FY 1986 and \$4.5 million in FY 1987.

Several significant modifications continue in FY 1986. Largest among them is the AH-1T Engine retrofit. This major effort will incorporate the T700-GE-401 engine and the modified gearbox to satisfy current high hot requirements. The FY 1986 request includes \$31.3 million for this purpose and \$23.9 million in FY 1987 to continue it. HELIFIRE, an anti-tank weapon system developed by the Army, will be incorporated on AH-1J/T aircraft. Necessary integration/interface modifications are budgeted in FY 1986 (\$12.9 million) and FY 1987 (\$13.7 million). Navy UH-1N helicopters being used for Search and Rescue are currently restricted to daylight operations or night operations when a horizon can be seen. To update these helicopters with a system that will allow night operations under all conditions, \$9.0 million in FY 1986 and \$5.1 million in FY 1987 are budgeted for the Automatic Hover Coupler modification. The system is currently being installed in SH-60B aircraft.

\$3.2 million in FY 1986 and \$2.2 million in FY 1987 are requested for the AN/APR-44 modification for UH-1 aircraft. This continuous wave warning receiver will enhance aircraft survivability in the modern threat environment. Two safety modifications included in the FY 1986 request are the Crashworthy Pilot Seats (\$4.4 million in FY 1986 and \$5.8 million in FY 1987) and the Crashworthy Pilots Seats (\$4.4 million in FY 1986 and \$5.8 million in FY 1987). Both modifications will

#### H-1 Series Modification cont'd

significantly enhance survivability in the event of helicopter crashes. \$2.6 million in FY 1986 and \$10.3 million in FY 1987 are requested for the AH-1 Navigation System program. This modification will incorporate the AN-APN-217 doppler and associated cockpit instrumentation to facilitate effective low level and night operations. Other smaller H-1 modifications include the Position Location and Reporting System (\$1.1 million in FY 1986 and \$1.1 million in FY 1987) and UH-1 Defense Armament System (\$1.1 million in FY 1986 and \$1.2 million in FY 1987). Three HH-1 aircraft modifications budgeted in FY 1986 are the HH-1K Electronic Warfare Equipment (\$1.5 million and \$4.9 million in FY 1986 and FY 1987, respectively), the HH-1K Night Vision modification (\$.9 million in FY 1986 and \$1.3 million), and the HH-1K Crashworthy Fuel System (\$1.5 million in FY 1986).

Programs for which authorization are requested in FY 1987 are the AH-1 Position Location Reporting System (\$1.8 million), the AH-1 EW Suite (\$4.9 million), and the UH-1 Auxiliary Crashworthy Fuel System (\$2.4 million).

#### H-2 Series Modification

Modifications for the H-2 series total \$33.9 million in FY 1986 and \$26.0 million in FY 1987. \$8.1 million and \$5.5 million in FY 1986 and FY 1987 respectively, are requested for Tail Pylon/Aft Drive Train Improvements. Basically, this modification will redesign the tail rotor gear box housing and substitute a stronger aluminum alloy for the magnesium currently in use to provide greater fatigue and corrosion resistance. Additionally, the horizontal stabilizer will be redesigned and will be manufactured of titanium to prevent sticking and binding, the flapping and pitch bearings will be changed, and a new forged aluminum tail rotor gearbox mounting rib will also be incorporated. The current AC fuel quantity system has been a reliability problem, and the use of 60 gallon auxiliary fuel tanks has limited the time on station and combat radius of the SH-2F's ASW mission. To alleviate these problems, \$3.2 million in FY 1986 and \$2.1 million in FY 1987 are requested for the Fuel System and Auxiliary Fuel Tanks modification which, as the title suggests, will make the necessary changes. \$2.3 million in FY 1986 and \$2.9 million in FY 1987 are requested for the Torpedo Depth Control. This airborne torpedo presetter will enable the crew to select/modify the operating mode and initial search depth parameters in real time as tactical information and the situation dictates. Another modification, the AN/ALE-39 Countermeasures modification is included and \$1.3 million in FY 1986 and \$1.5 million in FY 1987 are requested. The system, which replaces the cumbersome AN/ALE-37A, will greatly increase aircraft survivability.

Three programs scheduled for completion in FY 1986 are the ASN-123 TACNAV Set Improvement (\$3.6 million) which will increase the memory and processor speed of the ASN-123 and increase the number of sonobuoy launch tube signals that the system can handle, the AN/ARN-118 TACAN (\$1.6 million) and the AN/ARA-50 Direction Finder (\$1.2 million).

## H-2 Series Modification cont'd

Of the new programs budgeted in FY 1986, the Composite Main Rotor Blade effort and the Main Gearbox Improvements are the most significant. Substantial life cycle cost saving over the existing rotor blade system will be realized through the Composite Main Rotor Blade Program (\$6.8 million and \$7.1 million in FY 1986 and FY 1987, respectively). The composite blades will be completely compatible with the existing rotor system and reliability will be improved through the elimination of corrosive materials. The Main Gearbox Improvements, for which \$4.4 million in FY 1986 and \$4.2 million in FY 1987 are requested, will reduce overhaul cost, increase reliability and improve operational readiness. The remaining new starts are the Emergency Egress Lighting modification (\$.3 million in FY 1986 and \$2.3 million in FY 1987) and the Relocation of the TSEC/KY-28/KY-58 effort (\$1.1 million in FY 1986 and \$.4 million in FY 1987).

## H-3 Series Modifications

Of the \$98.0 million in FY 1986 and \$52.7 million in FY 1987 budgeted for H-3 modifications, \$48.6 million and \$22.6 million, respectively, are included for the SH-3H/G/D Service Life Extension Program (SLEP) which will extend the SH-3's service life past the year 2000. This program includes extensive rework or replacement of dynamic components, degraded structural components, out-moded flight controls and instrumentation, unreliable emergency flotation gear, and a general rewiring of the aircraft electrical system. Another major modification in the FY 1986 request is the Main Gearbox Improvement, \$11.4 million in FY 1986. By redesigning the free-wheel unit, modifying the lubrication system and improving various subcomponents, a 200 percent increase in main gear box mean time between failures (MTBF) is anticipated. \$13.5 million in FY 1986 and \$13.5 million in FY 1987 are requested to update the avionics of the executive mission (VH-3D) helicopters. These aircraft provide worldwide executive transportation for the President, Vice President, Foreign Heads of State and others as directed by the military office of the White House. Also supporting this mission is the VH-3D Main Gear Box Improvement. Similar to the main gear box program for other H-3 helicopters, \$1.6 million in FY 1986 and \$1.2 million in FY 1987 are requested for this effort.

Among the other continuing modifications in FY 1986 is the Emergency Egress modification (\$1.5 million in FY 1986 and \$.3 million in FY 1987) which will provide adequate life saving internal illumination should the helicopter submerge. \$2.6 million and \$1.0 million in FY 1986 and FY 1987, respectively, are requested for VHF Communication and Navigation equipment to permit communication with U.S. or foreign Civil Air Traffic Control and the U.S. Coast Guard. \$.9 million is requested to complete the HH-3A IR Suppression modification.

Several programs are scheduled to begin in FY 1986. \$5.6 million in FY 1986 is requested for AN/ASN-123 Tactical Navigation Set modifications. The present TACNAV system is unable to respond to current mission requirements due to inadequate computer memory. This modification will provide additional memory and increase the computer's processing rate. The program should complete in FY 1987 and \$5.5 million is included for that purpose. An enhanced MK-46/Advance Light Weight Torpedo Frenetier will permit cockpit control of MK-46 and EX-50 launch parameters. \$4.1 million and \$5.1 million in FY 1986 and FY 1987, respectively, are requested for this modification. To obtain an additional 100 shaft horsepower

### H-3 Series Modification cont'd

per engine, \$6.4 million in FY 1986 and \$2.8 million in FY 1987 are requested for the conversion of T58-GE-10 engines to T58-GE-402 engines. This change will alleviate power problems currently being experienced by SH-3H helicopters and will enable the aircraft to hover at full mission weight. Lastly, \$1.8 million in FY 1986 and \$.7 million in FY 1987 are requested for new HH-3A EW Suites.

### EP-3 Series Modification

\$38.5 million in FY 1986 and \$34.7 million in FY 1987 are requested for the EP-3 CILOP program. Goals of the program include extension of the airframe's service life, achieving commonality of mission avionics configurations and reducing/stabilizing, weight and balance. This CILOP will, among other things, establish an optimized ESM Mission Avionics Configuration, modify existing or procure new equipments to achieve that baseline in all EP-3 aircraft, and procure, integrate and provide Fleet Satellite Communications (FLTSATCOM) capability.

### P-3 Series Modification

Included in FY 1986 budget request and FY 1987 authorization request are \$152.9 million and \$266.0 million, respectively, for P-3 modifications. Of these amounts, \$2.0 million in FY 1986 and \$7.2 million in FY 1987 are associated with HARPOON related modifications. HARPOON-modified P-3B/C aircraft will be capable of carrying and launching four HARPOON missiles. Provisions for the HARPOON Airborne Command and Launch System include pylon modification, wing wiring, inter-connecting cables and data processor, logic unit control panel and other equipment. Incorporation of two new capabilities into the P-3B/C AQA-7 acoustic processing system, the Triple Vernier and the DICASS improvements, is greatly needed to meet the submarine threat of the 1980s. The Triple Vernier will increase acoustic sensor recognition and classification capabilities, while an improved DICASS will provide and enhanced long-range, single sonobuoy firing capability which presently does not exist. \$3.2 million in FY 1986 and \$13.8 million in FY 1987 are requested for this program. IRDS (Infrared Detecting System), for which \$6.5 million in FY 1986 and \$11.0 million in FY 1987 are requested, is an electro-optical surveillance system capable of recognizing and identifying surface targets including submarine periscopes and snorkels under night conditions. The system consists of night imaging sensors and associated electronics and display together with a video recorder.

The largest P-3 modification included in the FY 1986 budget request is the Advance Signal Processor program (ASP). This modification consists of the ASP, AN/USQ-78 Display/Control, AN/ALQ-158 Antenna, AN/ARR-78 Receiver, Auxiliary Power Unit update and the SG-1156/A. When incorporated, these components will provide significantly improved ASW acoustic detection and classification capabilities for target prosecution in average or poor water conditions. To continue this modification, \$94.0 million in FY 1986 and \$166.7 million in FY 1987 are requested. Continuation of the ALR-66 program is also requested. The ALR-66 ESM (Electronic Sensor Monitoring) system is a state-of-the-art replacement for the ALD-2B which is obsolete and lacks the required sensitivity, frequency coverage and bearing accuracy for threat warning.

### P-3 Series Modification cont'd

Procurement of this system requires \$20.6 million in FY 1986 and \$12.9 million in FY 1987. Additionally, the P-3C MAD Integration modification, which will be completed in FY 1986 (\$3.6 million), will enhance and in some cases procure the ASQ-81 system. Other continuing programs include the PARKHILL KY-75, \$1.8 million in FY 1986, which will provide secure voice communications and the Special Project Aircraft effort, \$5.5 million in FY 1986 and \$5.8 million in FY 1987. The HF Simultaneous Operations (SIMOPS) program continues and \$2.1 million and \$5.1 million are requested in FY 1986 and FY 1987, respectively. Through frequency filtering and modification to the aircraft communication switching matrix, this effort will permit independent operation of the two HF radios currently incorporated in P-3C aircraft in transmit and receiver modes simultaneously, without frequency interference. Finally, \$1.2 million in FY 1986 and \$1.0 million in FY 1987 are requested for Ditching Improvement, a safety of flight modification, \$0.6 million in FY 1986 and \$0.7 million in FY 1987 are requested for ERU-14/A Bomb Racks, and \$1.1 million in FY 1986 and \$1.1 million in FY 1987 are requested for the Omnibus Reliability and Maintainability Improvements modification.

Only three new programs are requested in FY 1986. To improve the P-3C aircraft's ability to detect and counter surface/subsurface-to-air missiles and anti-aircraft gunfire, \$3.4 million in FY 1986 and \$13.5 million in FY 1987 are requested for the Survivability and Vulnerability program. By incorporating the AN/ALQ-156 active missile detection and the AN/ALQ-29 infra-red flare and chaff dispenser, the P-3C will have a self defense capability against infra-red and radar threats. The system will automatically detect flares, chaff or both upon missile detection. Retrofit of AN/ARC-182 radios into the P-3 series and AN/ARC-187 UHF radios into P-3C aircraft is scheduled to begin in FY 1986. The AN/ARC-182 is the Navy's Standard VHF radio for tactical aircraft. Besides providing commonality, it will reduce crosstalk interference problems and provide the 25 kHz channel spacing capability required by International Air Traffic Control regulations. A derivative of the U.S. Air Force AN/ARC-164, the AN/ARC-187 will provide the necessary adjacent channel selectivity and internal intermodulation protection required in today's operational environment. \$5.2 million in FY 1986 is requested to initiate this program, and \$11.1 million in FY 1987 is requested to continue. The final new start is the Solid State Synchronizer modification which will replace the current vacuum tube engine synchronizer with a solid-state model (\$2.1 million and \$1.6 million in FY 1986 and FY 1987, respectively).

Authorization for two FY 1987 programs starts is requested. The ALR-77 ESM system will provide frequency coverage of the full threat emitter spectrum, will permit the through put to enable real-time processing of signals in the spectral density of the 1990's, and will analyze complex signals as well as improve reliability of the existing AN/ALQ-78. \$13.0 million in FY 1987 is requested for this major modification. Lastly, \$1.5 million in FY 1987 is requested for the Ground Proximity Warning System safety change.

### S-3 Series Modification

Modifications to the S-3 series aircraft require \$284.3 million in FY 1986 and \$342.4 million in FY 1987. The most significant is the ongoing Weapon System Improvement Program (WSIP), \$220.8 million. This program will greatly enhance ASW capability of the S-3A aircraft and on-board processing, display, control, and ESM systems will be expanded. Addition of the Inverse Synthetic Aperture Radar (ISAR) will provide standoff identification of surface targets. Finally, HARPOON

### S-3 Series Modification cont'd

launch capability and chaff and flare dispensing will be procured for self defense. Following this massive update, the aircraft will be redesignated the S-3B. \$260.5 million is requested in FY 1987 to continue this program \$19.6 million in FY 1986 and \$22.8 million in FY 1987 are requested for the Auxiliary Power Unit Replacement. This change consists of providing an additional auxiliary power unit that will be capable of producing increased compressed air while simultaneously providing 45 KVA vice 2 KVA electrical power. Increased air and power output will permit S-3A avionics systems to be ground operational for maintenance etc., without external cooling or power.

Increased reliability and maintainability is the goal of the Display Generator Unit (DGU) modification (\$8 0 million and \$11.8 million in FY 1986 and FY 1987, respectively). By redesigning the unit and replacing obsolete parts, a 300 percent increase in reliability can be achieved. The ICS Communication Control Group program is also geared toward improved reliability. This effort will replace the existing ICS with a state-of-the-art set utilizing large scale integration and microprocessor technology in place of the current ICS's "hard wire" logic system. The number of components in the new equipment will be reduced as well. \$9.4 million in FY 1986 and \$11.4 million in FY 1987 are requested. The AN/APS-116 has experienced reliability problems and approximately 10 percent of the Shop Replaceable Assemblies are responsible for greater than 50 percent of equipment failures. \$1.1 million in FY 1986 and \$1.2 million in FY 1987 are requested to replace the affected components.

\$7.3 million in FY 1986 and \$7.9 million in FY 1987 are requested for FLIR Reliability Improvements which will provide an eight-fold increase in mean time between failure. The ASA/82 Tactical Display System modification, \$6.7 million in FY 1986 and \$7.0 million in FY 1987, will replace out-moded display systems with more modern equipments. The three remaining continuing programs address reliability and maintainability deficiencies. \$3.0 million in FY 1986 and \$1.9 million in FY 1987 are requested for Right Hand Aft Avionics Rack modification \$1.8 million in FY 1986 and \$1.5 million in FY 1987 are requested for the Turbine Air Bearing program; and \$3.4 million in FY 1986 is requested to complete the Pitch Trim Actuator effort.

New programs in FY 1986 include the Off Line On Top Position Indicator (\$3.1 million in FY 1986 and \$2.8 million in FY 1987), a change that will provide a moderate increase in reliability and a major improvement in ASW mission capability; the MK-46 Presetter Interface (\$2.1 million each in FY 1986 and FY 1987); the Elevator Trim Tab Hinge Bearing (\$.6 million in FY 1986 and \$.4 million in FY 1987); the APU Pump Handle Holder (\$.2 million in FY 1986 and \$.7 million in FY 1987); and finally the Anti-Collision Strobe Lights safety change (\$.2 million in FY 1986). Authorization for the Engine Inlet modification (\$7.7 million) and the ASN-120 Navigation System (\$2.7 million) is requested in FY 1987.

### E-2 Series Modification

\$72.1 million in FY 1986 and \$112.6 million in FY 1987 are requested for E-2 modifications. The TRAC-A Weapon Improvement program, for which \$33.5 million in FY 1986 and \$35.1 million in FY 1987 are budgeted, will procure a new radar antenna and associated interfacing hardware to allow the E-2C to keep pace with the jammer threat. Changes in the nature of the threat since the Passive Detection System (PDS) ALR-59 was designed, and fleet experience with the operator workload

#### E-2 Series Modification cont'd

For the present configuration, require increasing the capability of the memory and adding additional functions. For this effort, \$10.3 million and \$5.4 million in FY 1986 and FY 1987, respectively, are requested. The submission includes \$8.7 million in FY 1986 and \$9.2 million in FY 1987 for the AN/ARC-182, a new radio that provides secure voice communications and is planned for most tactical aircraft. \$1.5 million in FY 1986 is requested to complete the Vertical Control Surface improvements.

Several small capability enhancement modifications that are included in the FY 1986 request are the Refractometers program (\$7 million in FY 1986 and \$8 million in FY 1987), the Pylon Fixed Fairing modification (\$5.5 million in FY 1986 and \$3.3 million in FY 1987), and provisions for the PARKHILL KY-75 (\$5.2 million in FY 1986 and \$4.4 million in FY 1987). A variety of small modifications, primarily oriented towards improved safety and reliability, are budgeted in FY 1986, and a total of \$2.0 million in FY 1986 and \$1.4 million in FY 1987 are requested for them. These programs are: the 10 KVA Emergency Generator, the Attitude Gyro Change, the Passive Detection System, the Fuel Quantity Indicating System, and the Omnibus Safety Mods program.

Of the five new programs included in the FY 1986 request, the largest among them is the E-2C Radar Update Group I. This modification program will retrofit changes that will increase detection in jamming environments, provide automated cues to the operators on the best radar mode for different jamming levels and provide directional information of the source for intercept with battle group fighters. Additionally, the modification will improve surface surveillance capability by stabilizing target tracking symbology and improve position accuracy on surface targets under varying conditions of sea clutter. To initiate this comprehensive program, \$8.3 million in FY 1986 and \$32.5 million in FY 1987 are requested. Another new start is the Aircrew Emergency Egress modification. An essential safety change, \$4.1 million in FY 1986 and \$3.6 million in FY 1987 are requested. Other programs beginning in FY 1986 are the Computer Recorder Reproducer (\$1.6 million in FY 1986 and \$2.3 million in FY 1987), the Tactical Command and Control System (\$5.3 million and \$5.0 million in FY 1986 and FY 1987, respectively) and the UHF RT-1017 program (\$5.4 million in FY 1986 and less than \$50 thousand in FY 1987).

Authorization is requested for the SPN-41 Instrument modification, \$5.9 million; the ARQ-34 Power Measures Diodes, \$5.8 million; the Cockpit Instrument Change, \$1.0 million, and the High Speed Processor (HSP) program, \$13.9 million. The HSP will replace two memory modules and their associated power supplies in the central processor (CP) cabinet to achieve a four-fold increase in CP track capacity and allow the radar and passive detection systems to operate throughout their available surveillance volume without the current sectoring restrictions. This capability is the foundation of extending the next phase of the E-2C update.

#### Trainer Aircraft Modification

\$5.3 million in FY 1986 and \$8.2 million in FY 1987 are requested for various modifications to trainer aircraft. The Trainer Aircraft Modification line item provides a comprehensive list of modifications budgeted for the T-2, TC-4C, T-34, T-38, T-39, T-44, and TH-57 series aircraft. Within the account, \$1.5 million in FY 1986 and \$7.3 million in FY 1987 are

#### Trainer Aircraft Modification cont'd

requested for the AN/ARN-118 TACAN for T-2 aircraft. In addition, \$.9 million in FY 1986 and \$1.3 million in FY 1987 are requested for T-2 aircraft ARC-159 radios. A TC-4C Update modification is included in the FY 1986 request; \$1.3 million in FY 1986 and \$2.5 million in FY 1987 are requested. Finally, \$1.6 million in FY 1986 and \$2.1 million in FY 1987 are requested for other small modifications including FAA Configuration Updates to various trainer aircraft, TH-57 Service Bulletins and the T-34C Landing Gear Actuation System.

#### EC-130 Series Modification

Budget authority of \$6.5 million in FY 1986 and authorization of \$14.2 million in FY 1987 are requested for EC-130 series modifications. \$5.0 million in FY 1986 and \$1.5 million in FY 1987 are requested for the Mission Avionics modification. Goals of this program include expansion of the present capabilities of the EC-130 avionics in accordance with the Minimum Essential Emergency Communication Network (MEECN) Master Plan and improved reliability and maintainability. A one year program to replace the existing, obsolete Teletype Keyer/Converter Group (TH-100) is included in FY 1986 (\$.5 million). Finally, the TACAMO Reliability Assessment Program (TRAP) has identified two equipments within the VLF-transmit link of poor reliability that require replacement. The first of these is the Dual Trailing Wire Antenna Group improvement (\$.5 million in FY 1986 and \$3.4 million in FY 1987) and the other involves modifications to the Power Amplifier/Coupler Group (\$.5 million in FY 1986 and \$1.7 million in FY 1987).

Funding is requested for three new initiatives in FY 1987. \$4.0 million is designated for the Survivable Time Standard, a program which will replace the existing unreliable rubidium frequency and time standard supporting the VERDIN with two crystal standards and one satellite receiver. Authorization is also requested for the UNH-16 Recorder (\$1.9 million), the KG-84 Installation (\$.7 million), and the PSK Modems (\$1.0 million).

#### C/KC-130 Series Modification

In the FY 1986 budget request and FY 1987 authorization request, \$12.5 million and \$12.1 million, respectively, are budgeted for C-130 and KC-130 aircraft modifications. A continuation of the Avionics System Improvement Program (Phase II) will procure new VHF communications and navigation equipment, a modern TACAN, and add the safety-related Ground Proximity Warning System. \$4.9 million in FY 1986 and \$4.9 million in FY 1987 are requested for this reliability improvement. The third phase of the Avionics Update (\$5.1 million in FY 1986 and \$6.0 million in FY 1987) continues as well. Among the modifications included are the incorporation of the solid state propeller synchronization, compass system, HF secure voice capability, combined altitude radar altimeter (CARA), engine instruments, flight detector and many other avionics equipments. The final year of the Fuel Quantity Indicator System modification is requested, \$.9 million in FY 1986. \$1.3 million in FY 1986 and \$.8 million in FY 1987 are requested for improvements to the Cargo Handling System. Finally, two safety related modifications, Strobe Lights and Emergency Exit Lights are included and \$.3 million in FY 1986 and \$.4 million in FY 1987 are budgeted to cover the two of them.



#### FEWSG Series Modification

The ability to accurately simulate the known and postulated EW characteristics and tactics of different threats for Fleet training is a primary mission element of the Fleet Electronic Warfare Support Group (FEWSG) and its assigned aircraft and equipments. In support of this program, \$22.7 million in FY 1986 and \$28.3 million in FY 1987 are requested for FEWSG modifications. Largest of the lot, the ALQ-170 (V2) Simulator program (\$12.6 million in FY 1986), will procure a series (variants) of missile simulators which simulate Anti-Ship missiles for Fleet exercises and training. Both specific and non-specific threat simulators will be obtained. Major components of the V2 simulators will be totally interchangeable with those of the basic AN/ALQ-170 (V1) and will expand and update the system's capability to cover state-of-the-art improvements in a particular threat or family of threats. To continue this effort, \$15.6 million in FY 1987 is requested. To provide an ECM device that simulates threat defense ECM systems and several types of threat anti-ship missile seeker systems, \$3.8 million in FY 1986 and \$2.3 million in FY 1987 are requested for the AN/ALQ-167 and AN/AST Pods.

A new start, the Pylon Wiring/Avionics update is necessary to accommodate the existing missile seeking simulator and the new Generic Simulator installments in the A-4 (\$5.6 million in FY 1986 and \$2.2 million in FY 1987). \$5.9 million is being requested in FY 1986 with a follow-on of \$1.0 million in FY 1987 to continue procurement of the C3C3M simulation devices. Five one-year efforts, the AN/ALT-40 updates (\$1.8 million), the NKC-135 Wing Reskin (\$1.7 million), the FAEWS Graphic Displays (\$5.5 million), the System Upgrades (\$4.4 million) and the ERA-3B Communications/Navigation Avionics (\$9.2 million) are also budgeted for FY 1986. Authorization in FY 1987 is requested for the NKC-135 Re-Engine Program (\$9.2 million).

#### Cargo and Transport Aircraft Modification

A total of \$6.9 million and \$15.2 million are requested in FY 1986 and FY 1987, respectively, for the Cargo and Transport Modification line item which provides a comprehensive list of modifications budgeted for C-1A, C-2 C-9B, C-131, and UC-12 aircraft.

The UC-12 Ground Proximity Warning System requires \$1.2 million in FY 1986. A safety modification, the Ground Proximity Warning System will provide audible and visual warning of imminent inadvertent ground contact. \$0.3 million is required in both FY 1986 and FY 1987 to continue procurement for the C-131 Modernization for Safety, Reliability and Maintainability program and \$0.8 million is requested for both FY 1986 and FY 1987 for the C-9 HF Communications Update.

Three programs are due to commence in FY 1986. Two other modifications, the CT-39 Avionics Update (\$2.2 million in FY 1986 and \$1.1 million in FY 1987) and the C-9 Service Standardization (\$3.3 million in FY 1986 and \$5.4 million in FY 1987) are requested in FY 1986. The CT-39 Avionics Update replaces outdated technical equipment on previously procured CT-39E/G aircraft which still provide a necessary service. The C-9 Service Standardization will provide logistics commonality between retrofitted DC-9s and existing C-9B aircraft. In addition the FAA Configuration Update (\$1.1 million in FY 1986 and \$1.3 million in FY 1987) maintains configuration integrity and FAA certification for the C-9, UC-12 and CT-39 and provides corrective change information or detailed modification instructions for these aircraft. Authorization in FY 1987 is requested for the C-2 AN/ARC-182 retrofit (\$4.7 million) and the C-2 On Board Oxygen Generating System (\$2.6 million).

#### Various Modifications

A total of \$15.6 million in FY 1986 and \$1.8 million in FY 1987 are requested for the Various Modifications line item. Four modifications are budgeted in FY 1986. \$2.2 million in FY 1986 is requested for the Sea Water Actuated Release System (SEAWARS). A safety modification, the SEAWARS provides automatic parachute release upon immersion in sea water to preclude aircrew drownings through parachute entanglement and water dragging. \$1.9 million in FY 1986 and \$1.2 million in FY 1987 are included for RSSK-7 Survival Kit Replacement which will substitute the SKU-2/A for the RSSK-7, a highly unreliable system. The major new start, the 30MM Gun Pod, will be a replacement for the existing 20MM Gun to increase attack capability against a variety of targets, and \$11.0 million in FY 1986 is requested for this program. The Helo Chemical/Biology/Radiology program, a one year modification, requires \$1.5 million in FY 1986.

Authorization of \$1.6 million in FY 1987 is requested for the NAVSTAR Global Positioning System. This system is designed to provide highly accurate passive positioning in all weather conditions and will interface with existing communication, navigation and weapon systems equipment.

#### Power Plant Changes

This modification program funds procurement of kits for incorporation of a large number of primarily small dollar value power plant changes into the appropriate engine population. For this purpose, \$8.3 million in FY 1986 and \$11.7 million in FY 1987 are requested.

#### Miscellaneous Flight Safety and Operational Necessity Changes

The FY 1986 budget request and FY 1987 authorization request includes \$4.3 million and \$6.9 million, respectively, for safety related modifications. This program provides for the procurement of kits to correct flight safety and operational mission capability deficiencies which are revealed during actual operation of aircraft in the fleet under diverse tactical and environmental conditions.

#### Common ECM Equipment

A total of \$242.0 million in FY 1986 and \$108.5 million in FY 1987 are requested for Common ECM equipment. The largest of the efforts budgeted, the AN/ALQ-126B, consists of an updated ALQ-126A with improved reliability and performance against prevailing threat emitters. \$75.0 million in FY 1986 is requested for this vital program.

The ALR-45 modification funds the retrofit of the CP-1293/ALR-67 computer/countermeasures and the IP-1276/ALR-67 azimuth display which have been re-designated the AN/ALR-45F(V). At a cost of \$18.4 million in FY 1986, the AN/ALR-45F will provide a software reprogrammable analyzer, an alpha-numeric display of threat bearing and identification, and threat data hand-off capability for the AN/ALQ-126 and AN/ALE-39.

#### Common ECM Equipment cont'd

Three additional programs budgeted in the Common ECM Equipment line are the AN/APR-43, the AN/ALR-67 and the AN/ALQ-162 which are common equipments. The AN/APR-43 is a radar warning receiver that provides enhanced countermeasures warning and direction finding capability beyond that currently available. \$29.9 million in FY 1986 and \$17.7 million in FY 1987 are requested for this system. An improvement in capability, reliability and maintainability, the AN/ALR-67 radar receiving set will provide detection and direction finding coverage over the entire known radar/missile frequency bands for types of emissions used for target tracking and missile control (\$59.7 million and \$67.2 million in FY 1986 and FY 1987, respectively). Finally, \$45.7 million in FY 1986 and \$13.3 million in FY 1987 are requested for the AN/ALQ-162 Countermeasures Set, a system that provides complementary DECM jamming capability to the operation of AN/ALQ-126 DECM jammer.

\$13.3 million in FY 1986 and authorization of \$10.3 million in FY 1987 are requested for the AN/APR-39 Improvement. This program will update the existing equipment by replacing the analog processor with a digital model, replacing the current receivers and antennas to expand the frequency coverage, and finally, by replacing the cockpit control panel.

#### Common Avionics Changes

\$23.9 million in FY 1986 and \$32.1 million in FY 1987 are requested for miscellaneous avionics changes. Of the total request, \$13.9 million in FY 1986 and \$16.3 million in FY 1987 are requested for the Digital Air Data Converter, a form, fit and function replacement for several unreliable and obsolete air data computers in the inventory. Two modifications to the AN/APX-76 interrogator unit are included in the FY 1986 request. \$2.1 million and \$2.5 million in FY 1986 and FY 1987, respectively, are requested to procure additional AN/APX-76 sets to retrofit early production F-14 aircraft and outfit F-4 aircraft on a one-for-one vice the current one-for-two basis. Completion of the AN/APX-76 Anti-Jam modification is also included in the FY 1987 authorization, \$3.4 million. Replacement of a variety of radar altimeter sets, equipments that provide continuous indication of aircraft altitude, with a more reliable and accurate system is a prerequisite to safe aircraft operation. \$1.8 million in FY 1986 and \$2.2 million in FY 1987 are requested for the AN/APN-171 system to satisfy this requirement. Continuing programs included in the FY 1986 budget are the AN/APN-154 Radar Beacon reliability improvement (\$1.6 million in FY 1986 with a follow-on procurement of \$2.2 million in FY 1987), the AN/APN-182 Navigation Set (\$1.5 million in FY 1986), the APN-194(V) Microstrip Antenna (\$1.5 million in FY 1986) and the ARC-51 Reliability and Maintainability Improvement (\$2.2 million in FY 1986), and finally, authorization to continue the AN/APX-64 (V) IFF Transponder, (\$1.6 million) and the AN/APX-72 IFF Transponder, (\$1.6 million) is required in FY 1987. The UHF Relay Pod provides an improved communications capability for the fleet. \$3.3 million is requested for FY 1986.

\$3.8 million is requested for authorization in FY 1987 for the Standard Altitude Heading Reference System. The SAHRS is a joint service program lead by NAVAIR which provides aircraft with improved altitude, heading and dead reckoning navigation data. \$1.5 million is requested for FY 1987 authorization for the AN/AYK-14 Processor Module.

Budget Activity 6: Aircraft Spares and Repair Parts

(\$ in Thousands)

FY 1987 Estimate - \$2,272,329  
FY 1986 Estimate - \$1,463,662  
FY 1985 Estimate - \$1,534,496  
FY 1984 Actual - \$1,939,428

Purpose and Scope of Work

APN Budget Activity 6 funds the procurement of the spare equipment and repair parts necessary to support Navy and Marine Corps aircraft procurement and operating programs. The budgeted funds provide for: (1) initial outfitting and pipeline quantities of repairable spares and repair parts for new and modified aircraft; and (2) buyout of depot level repairable spare parts from the Navy Stock Fund (NSF) by means of the aviation outfitting account in the year of delivery, and a small number of non-stock funded replenishment spares.

Justification of Funds

On 1 April 1981, Navy commenced a test of financing the procurement and repair of non-aviation Depot Level Repairable (DLR) components in the Navy Stock Fund. Prior to this time, procurement of these items was funded in either Weapons Procurement, Navy (WPN) or Other Procurement, Navy (OPN) and repair was funded on a "free issue" basis. Under stockfunding a "buyer/seller" relationship is established and users of non-aviation DLRs pay for what they requisition. The purpose of the test was to determine if readiness would be improved via better material support and economies achieved due to the "buyer/seller" relationship. To date, the test has been extremely successful; therefore, in attempt to attain similar benefits in aviation DLR material support, the Navy is expanding the test to aviation DLRs. The FY 1986 budget incorporates all funding realignments for this test expansion. The expanded test is to begin in April 1985, and to continue through FY 1988.

The FY 1986 budget request for aircraft spares and repair parts is \$70.8 million lower than the amount funded in FY 1985. The decreased request reflects the transition of depot level repairable spares into the Navy Stock Fund on 1 April 1985 and projected cost savings related to the Secretary of Defense's ten point spares procurement cost reduction program. The following table depicts the FY 1984 through FY 1987 funding profile for the spares account:

	FY 1984	FY 1985	FY 1986	FY 1987
(\$ in Millions)				
Initial Spares and Repair Parts	\$ 686.8	\$ 672.6	\$ 693.7	\$ 835.4
Replenishment Spares and Repair Parts	1,252.6	861.9	770.0	1,436.9
Total Aircraft Spares and Repair Parts	\$1,939.4	\$1,534.5	\$1,463.7	\$2,272.3

INITIAL SPARES:

Initial spares requirements reflect the number, type and deployment of aircraft being procured and entering the

operating program. The only items being procured under the initial spares category are engines and spares for those equipments and parts which have been recently introduced and therefore have no adequate demand history. Funding requirements for engines and for major avionics and other equipments with a significant unit cost qualifying as initial spares are calculated on an item-by-item basis where possible, considering usage data, failure rates, and engineering estimates based on predicted usage for new items. Requirements for other initial spares and spare parts are determined on a statistical basis, using the same methodology used in calculating major spare equipment requirements.

The following table shows FY 1986 and FY 1987 Initial Spares and Repair Parts support requirements by aircraft model:  
(\$ in millions)

Aircraft Model	FY 1986					FY 1987					Total	
	Aircraft Quantity	Spare Engines	Contractor Spares	PGSE Spares	Initial Spares	Aircraft Quantity	Spare Engines	Contractor Spares	PGSE Spares	Initial Spares	Total	Initial Spares
A-6E	6	-	3.9	5.9	9.8	6	39.5	4.5	1.2	45.2		
EA-6B	12	6.7	6.6	9.0	22.3	12	9.9	8.1	5.6	23.6		
AV-8B	46	55.3	32.3	10.0	97.6	47	68.6	20.1	4.3	93.0		
F-14A	18	-	6	10.0	10.6	18	24.3	4.7	14.0	43.0		
F/A-18	84	42.3	41.2	4.3	87.8	102	76.6	66.4	6.9	149.9		
CH-53E	14	17.4	6.9	.3	24.7	14	19.8	3.2	.1	23.1		
AH-1T	22	9.3	7.2	-	16.5	-	3.8	-	-	3.8		
SH-60B	18	4.7	3.5	.1	8.3	18	4.1	7.2	-	11.3		
VH-60	9	10.2	14.8	.1	25.1	-	-	-	-	-		
CV ASW HELO	-	-	-	-	-	7	5.0	8.4	-	13.4		
P-3C	9	-	8.7	1.2	10.0	9	2.9	6.7	.9	10.5		
E-2C	6	5.9	14.6	10.1	30.6	6	4.1	17.7	6.4	28.2		
SH-2F	6	-	1.4	-	1.4	-	-	-	-	-		
C-2	8	3.6	.5	.4	4.4	9	4.3	.6	-	4.9		
Advers / (F-16)	12	9.4	5.4	-	14.8	-	-	-	-	-		
E-6A	2	12.2	32.4	-	44.6	4	14.1	21.3	-	35.4		
ATE Spare Parts				52.0	52.0				68.5	68.5		
CGSE Repair Parts 1/				29.7	29.7				28.6	28.6		
Training Device Ptn			20.1		20.1			39.1		39.1		
Airborne Weapon Spares			10.5		10.5			8.9		8.9		
Modification Spares					173.0					205.0		
TOTAL		177.0	210.7	133.0	693.7		277	216.8	136.5	835.4		

Totals may not add due to rounding.

1/ Supports equipment procured in B.A. 7.

Initial spares and repair parts are categorized as follows:

- (1) Government Furnished Spare Aircraft Engines - (FY 1986 - \$177.0 million; FY 1987 - \$277.0 million).

Spare aircraft engine requirements are calculated on an actuarial basis to support the aircraft operating program with a confidence level of 80% to 90% that a spare engine will be on site and ready for issue when required by combat aircraft. Requirements are determined by developing a flying hour program for each type/model aircraft and applying against it engine repair and removal rates to determine total engine procurements. On hand and on order assets are deducted from this gross requirement to arrive at a net procurement requirement. Requirements are thus established for initial outfitting of shore sites and carriers and to fill maintenance repair/overhaul pipelines.

- (2) Contractor Spares Support - (FY 1986 - \$210.7 million; FY 1987 - \$216.8 million)

Contractor furnished spares and repair parts are provided for support of new, sophisticated weapons systems or subsystems during their development, test and fleet introductory phases until either the Navy Support Date (NSD) or Material Support Date (MSD) is reached, at which time the Navy supply system assumes responsibility for providing all spares and repair parts. Contractor support is designed to preclude procurement of unnecessary or unstable spare parts before usage data is available or aircraft equipment design is frozen. Requirements are calculated by comparing the new weapon system with historical data for a similar/same aircraft and utilizing the Weapon System Planning Document (WSPD) which provides the site activation schedule.

- (3) Peculiar Ground Support Equipment (PGSE) - (FY 1986 - \$133.0 million; FY 1987 - \$136.5 million)

The funding requested here provides for repair parts essential to the support (readiness) of PGSE and items required for the ground testing, servicing, handling and maintenance of specific weapon systems and their sub-systems. These PGSE end items require complete integrated logistic support (ILS), including repair parts, concurrent with delivery in order to adequately support the related weapon systems.

PGSE spares funding in FY 1986 and subsequent years provides for contractor augmented support. Requirements are determined by the initial quantity of PGSE end items procured, the complexity/cost of the end items, the number of sites to be supported, the proximity/inter-support relationship of shore-based sites, and the period of time between equipment introduction and material support date.

- (4) Modification Spares - (FY 1986 - \$173.0 million; FY 1987 - \$205.0 million)

The investment program also includes procurement of initial repairable spares and repair parts to support modification programs financed under APN Budget Activity 5. Requirements include new procurement and/or the modification of spares and repair parts already in the inventory. Requirements are based on the corresponding elements being procured for the aircraft modification program.

#### REPLENISHMENT SPARES:

Total funding requested for all replenishment spares programs is \$770.0 million in FY 1986 and \$1,436.9 million in FY 1987. Most of the replenishment spares requirements are in the aviation outfitting account to buy aviation depot level repairable outfitting spares from the Navy Stock Fund. The establishment of the aviation outfitting account resulted from the decision to manage all aviation depot level repairables in the Navy Stock Fund as of 1 April 1985. The remainder of the replenishment spares program includes non-Navy Stock Fund Inventory Control Point repairable spares requirements managed by the Aviation Supply Office and the Ships Parts Control Center, and Naval Air Systems Command (NAVAIR) headquarters spares requirements.

The replenishment spares element of the budget funds the procurement of repairable components in support of all Naval aviation spares requirements subsequent to the end of the initial support period. The replenishment spares element of the budget is made up of:

The following table displays the funding breakdown for the above replenishment spares programs:

	FY 1986	FY 1987
(\$ in Millions)		
Inventory Control Point Support	\$ 9.7	\$ .2
Aviation Outfitting Support	743.1	1,403.7
Interservice Support	5.1	10.2
Executive Mission Helicopters	5.5	14.4
F-5/T-38 Aircraft	2.8	3.4
Miscellaneous Headquarters	3.8	5.0
TOTAL REPLENISHMENT SPARES	\$ 770.0	\$ 1,436.9

The replenishment spares are categorized as follows:

- (1) Inventory Control Point (ICP) Support - (FY 1986 - \$9.7 million; FY 1987 - \$0.2 million)

Spares repairable components are managed by the Aviation Supply Office and the Ships Parts Control Center, which have been assigned program support responsibility for specific aircraft/weapon systems. Spares requirements are calculated by an individual line item stratification technique. The Uniform Inventory Control Point (UICP) stratification requirements are computed utilizing DOD logistics guidance, Navy program planning data, and technical, procurement, and inventory data maintained by the ICP. During stratification, these components are evaluated in terms of inventory on hand and on order, demand experience, projected demand, and outfitting requirements.

- (2) Aviation Outfitting Support - (FY 1986 - \$743.1 million; FY 1987 - \$1,403.7 million)

This account funds payment at time of delivery for all Navy inventory control point managed outfitting requirements which were previously budgeted (through the first half of FY 1985) as either initial spares or follow-on replenishment spares in the APN-6 account. These requirements will be procured by the Navy Stock Fund and subsequently "bought out"

by this account beginning 1 April 1986. This approach was taken to: a) improve material availability, b) improve asset management, and c) add financial flexibility between rework and procurement of assets. The benefits are an improved logistics support posture and a corresponding improvement in aircraft readiness due to flexibility in the stock fund to either procure new assets or repair existing assets as determined by creation of a buyer/seller relationship in the issuance and return of aviation reparable spares.

(3) Interservice Support (ISS) - (FY 1986 - \$5.1 million; FY 1987 - \$10.2 million)

Funds are required to reimburse the Army and Air Force for reparable material used during both in house (organic) and service administered commercial overhaul work of Navy aircraft engines, airframes and other reparable components. Material requirements are calculated by the Army and Air Force for the Navy's projected overhaul/rework program and are validated through negotiation between the Naval Air Logistics Center and Army/Air Force representatives.

(4) Executive Mission Helicopters (XM) - (FY 1986 - \$5.5 million; FY 1987 - \$14.4 million)

Reparable spare components are required to support the VH-3D and VH-1N Executive Mission aircraft. The Executive Mission provides a transportation and evacuation capability for the Chief Executive, Heads of State and other visiting dignitaries. Eleven VH-3D and six VH-1N aircraft operate from one primary site and two auxiliary sites. In addition, the helicopters operate for extended periods of time from numerous other locations necessitating selected item pack ups. Material support requirements are calculated based on inputs from the operating squadron, the aircraft contractor and those peculiar requirements set forth by the Executive Branch. Executive Mission helicopters must have 100% spares support for reparable components. These components are procured so that a spare component will be on hand when the component reaches half of its projected service life.

(5) F-5/T-38 Aircraft - (FY 1986 - \$2.8 million; FY 1987 - \$3.4 million)

Funds are required for the procurement of reparable material support from the Air Force for 12 F-5E/F and 6 T-38A aircraft operating at 4 sites. Material requirements are developed by the weapon system manager and NAVAIR based on past spares usage, the projected flying hour program and the number of sites operating the aircraft.

(6) Miscellaneous NAVAIR Headquarters Support - (FY 1986 - \$3.8 million; FY 1987 - \$5.0 million)

This includes material support requirements for the Fleet Electronic Warfare Support Group (FEWSG), Project Beartrap, Project Churchplate, VH-3A aircraft support, Adversary aircraft support, and production compatibility changes. Spares requirements for FEWSG, Project Beartrap and Project Churchplate are developed by the Naval Avionics Center (NAC) in conjunction with the operational activities, based on past usage and anticipated system changes. VH-3A spares requirements are developed by the fleet operational squadron and NAVAIR, using historical data to project future material requirements. Spares requirements to support production compatibility changes were projected by NAVAIR using past historical data and anticipated future compatibility changes. Spares requirements for the Adversary aircraft were developed based on spares usage for the F-5E/F aircraft.



Budget Activity 7: Aircraft Support Equipment and Facilities

(In Thousands)  
FY 1987 Estimate - \$889,493  
FY 1986 Estimate - 864,674  
FY 1985 Estimate - 681,613  
FY 1984 Actual - 431,128

Purpose and Scope of Work

The FY 1986 budget plan of \$864.7 million and the FY 1987 authorization request of \$889.5 million provide continuing vital effort in the four following categories which support aircraft procurement programs:

- (1) Common Ground Equipment, which provides funds for Automatic Test Equipment (ATE), Avionics Support Equipment (ASE), various aircraft systems trainers and training aids, the Maintenance Information Automated Retrieval Systems (MIARS), the Engineering Data Management Information Control System (EDMICS), and other aircraft ground support equipment including Rapid Deployment Force requirements and mobile maintenance facilities for Marine expeditionary forces.
- (2) Aircraft Industrial Facilities, which provides calibration equipment for Navy standards and calibration laboratories. It also provides for capital improvements, modernization, and maintenance of government-owned, but contractor-operated, aircraft-producing industrial plants.
- (3) War Consumables, which provides funds for auxiliary fuel tanks, air refueling stores, pylons, and ejector racks and for the modification of these equipments. The new procurement items are of a consumable nature and are related primarily to the number of sorties flown by combat and training aircraft.
- (4) Other Production Charges, which provides funds for miscellaneous production support and testing services, aircraft cameras, various equipment for United States Coast Guard aircraft, and aircraft pods and instrumentation packages supporting tactical aircrew combat training and mobile sea range systems.

# Justification of Funds

Funding requirements for FY 1986 and FY 1987 are outlined in the following table:

	(Dollars in Millions)	
	FY 1986	FY 1987
Common Ground Equipment	Funding	Authorization
Aircraft Industrial Facilities	\$684.8	\$719.5
War Consumables	57.1	59.9
Other Production Charges	65.0	47.9
	57.7	62.1
Total B A. 7	\$864.7*	\$889.5*

Common Ground Equipment - FY 1986 \$684.8 million; FY 1987 \$719.5 million

The FY 1986 budget plan for the Common Ground Equipment Program totals \$684.8 million. The FY 1987 authorization request is \$719.5 million. Funding for the various segments of this program is depicted below and described in subsequent paragraphs:

	FY 1986	FY 1987
(a) Training Equipment	Funding	Authorization
(b) Automatic Test Equipment (ATE)	\$135.7	\$155.8
(c) Aircraft Common Support Equipment	224.2	220.1
(d) Mobile Maintenance Facilities	117.0	119.4
(e) Inventory Control Point (ICP) Managed SE	14.1	20.2
(f) Headquarters Managed PSE	99.2	107.8
(g) Gas Turbine Compressor Replacement	23.3	23.6
(h) Avionics Support Equipment	16.2	7.9
(i) Rapid Deployment Force/Maritime Prepositioned Ships	44.3	45.2
(j) Aircraft Salvage Equipment	7.7	7.8
(k) Maintenance Information Automated Retrieval	.8	9.6
Systems (MIARS)	1.5	1.4
(1) Engineering Data Management Information Control System (EDMICS)		
	.9	.9
Total Common Ground Equipment	\$684.8*	\$719.5*

\* Does not add due to rounding.

# Training Equipment

The FY 1986 budget request is \$135.7 million and the FY 1987 authorization request is \$155.8 million. The Training Equipment sub-line item provides funds for acquisition of trainers, training equipment, training parts, GFE/GSE for training purposes, and modifications/changes relating to the above acquisitions. The procurements funded within the Training Equipment sub-line item are limited to: (1) training devices and equipment and related modifications for generalized training programs which provide skills common to more than one weapon system, (2) trainers for out-of-production aircraft, and (3) GFE in support of courses at the Navy Formal Schools. Training on out-of-production aircraft is dependent upon these funds for all acquisitions, specific trainer-peculiar changes, modification/modernization, user-generated changes and replacement. The Training Equipment subline item is broken into two major categories, General Training Equipment and Modification/Modernization of Trainers. The following tables display funding profiles within the Training Equipment subline item:

## General Training Equipment

	(In Thousands)	FY 1986	FY 1987
Minor Aids and Devices		\$ 1,095	\$ 1,169
General Trainers		12,154	25,198
Air Combat Maneuvering Simulator		4,281	3,463
"A" School Trainers		30,325	20,537
Physiological Trainers		3,374	4,032
Laser Air-to-Air Gunnery Simulator		733	523
Landing Signal Officer Trainers		0	6,910
Total General Training Equipment		\$51,962	\$61,832

## Modification/Modernization of trainers requirements, including GFE for out-of-production weapon systems

Program	(In Thousands)	FY 1986	FY 1987
A-3		\$ 214	\$ 160
A-4		122	230
A-7		4,735	2,193
AV-8A		175	90
E-2B		133	1,155
EA-6A		10,400	25,646
E/K/C-130		1,105	1,569
F/RF-4		2,493	2,260
GFE for Formal Schools		3,037	

	(In Thousands)	
Program	FY 1986	FY 1987
H-1	1,041	1,582
H-3	14,020	6,393
H-46	4,998	4,495
CH/RH-53	4,927	1,363
OV-10A	47	89
P-3B	2,000	12,908
S-3A	30,958	31,674
T-2	3,051	945
TA-4J	244	461
TH-57	-	710
Total Modification/Modernization	\$83,700	\$93,923

#### ATE (Automatic Test Equipment)

The FY 1986 budget request includes \$224.2 million for ATE and the FY 1987 authorization request includes \$220.1 million for ATE. The ATE segment of the Common Ground Equipment budget line item was established to broaden this category of support equipment acquisition formerly limited to VAST (Versatile Avionics Shop Test). The ATE account funds the procurement of the new MINI-VAST and Tailored MINI-VAST, as well as a family of module testers including the Hybrid Tester, the Digital Tester, the Radar Communications Tester (RADCOM) and the Navigation Set Test System to support Inertial Navigation Systems in the fleet, and two types of Electronic Warfare Test Sets, the Advanced EW Test Set (AEWTS) and the New EW Test Set (NEWTS).

The new six-rack VAST-derived MINI-VAST was designed to accommodate the testing requirements of the advanced avionics systems in the F/TF/A-18A aircraft and other planned avionic systems which incorporate the latest electronic design technology. The new five-rack Tailored MINI-VAST will support the avionics systems of the SH-60B LAMPS MK III aircraft. MINI-VAST and Tailored Mini-Vast program objectives are: (1) to provide support as the principal avionics test equipment for F-18, TF-18, A-18 and LAMPS weapons systems; (2) to maximize commonality with the VAST system; (3) to preclude the development and introduction of new special purpose test equipment, and provide a more cost effective, logistically common and technically superior standard testing system; (4) to reduce the number of avionics technicians required in the avionics shop; and (5) to reduce shipboard avionics support spare requirements.

Acquisition of the NAVAIR standard digital module tester, the Computerized Automated Tester (CAT), is planned to continue consistent with contractor test program development and Fleet support requirements. This tester satisfies the stringent testing requirements of digital shop replaceable assemblies (SRAs) from a broad range of avionic systems which require dynamic testing data 10 MHz data rate with multiple logic levels. The CAT is presently deployed at over thirty operational sites including 12 CVs. Additional units are required to outfit F-14, E-2, A-6, and A-7 fleet operating sites.

The Hybrid Test Systems (HTS) is required to conduct the complex testing requirements of hybrid (combined analog and digital) and pure analog modules. Acquisition is planned to continue for support of F/A-18, AV-8B and SH-60 sites and to replace obsolete, manual testers in a planned off-load program for A-6, EA-6, E-2, and F-14 modules. This tester complements the CAT by providing broad general purpose support for SRAs.

The Navigation Set Test Station was originally developed to provide support for the AN/ASN-92 Carrier Air Inertial Navigation Set (CAINS) and to replace the 1960-era Peculiar Support Equipment (PSE) that had been acquired to support earlier inertial navigation systems. Design flexibility and growth potential have allowed expansion of the application of this versatile item of ATE. Continued procurement is required to optimize support of the AN/ASN-92, and ensure timely support of the F/A-18 INS and future advanced INS systems such as the Laser Inertial Navigation Set.

The advanced concept of AEWTS was developed in the 1980-82 timeframe to provide I-level support for carrier-based EW systems. This test station, with dual-port capability enables the computer and other station resources to be time-shared, thus allowing the testing of two (2) WRAS simultaneously. This technical approach was adopted to meet ship space reduction requirements by maximizing the use of test station assets. In addition, the RF power and digital testing capabilities will satisfy the most sophisticated present or planned EW systems testing requirements.

The New Electronic Warfare Test Set (NEWTS) is a semi-automatic I-Level maintenance tester used on various Tactical Air Electronic Warfare avionics WRA's. The authorization request is to fulfill NARF, CV, Reserve and Contingency Support Package (CSP) deployment requirements.

The Radar Communications Test Set (RADCOM) is included in the ATE authorization request. Originally developed to support advanced E-2C radar capabilities, the RADCOM has subsequently been selected to support A-6E, EA-6B, F-14D, SH-60B, and S-3B radar systems. Beginning in FY 1987 this tester will be transitioned from Budget Activity 1 to Budget Activity 7 as a common test set. It incorporates design flexibility, growth potential, standardization, and logistic commonality while containing the technical capabilities for testing the complex RF and digital requirements of new radar systems.

System modification is necessary to maintain technological currency and incorporate necessary reliability and maintainability improvements in two major, out-of-production items of ATE (i.e., Electro-Optical Systems Test Set (EOSTS) and VAST). Modifications to EOSTS are necessary in order to provide for continued support of A-6, S-3, A-7, P-3, and OV-10 electro-optical systems without sacrificing operational readiness. Similarly, VAST stations, which currently support over 150 weapons replaceable assemblies in the S-3, E-2, F-14 and A-7 aircraft, require improvement and enhancement in order to remain capable of satisfying the more complex testing requirements of new modified airborne avionics.

#### Aircraft Common Support Equipment

The Aircraft Common Support Equipment element under the Common Ground Equipment line item provides for the initial outfitting of Common Support Equipment under NAVAIR inventory and technical management. These Support Equipment (SE) end items are required for ground testing, servicing, handling, and maintenance of aircraft and their systems. SE items

acquired under this budget line item include engine propulsion test systems, mobile air conditioners and generators, and miscellaneous support items such as armament-handling equipment and aircraft firefighting equipment.

A comprehensive acquisition plan has been developed for each FY 1986 SE requirement item to ensure that the equipment is ready for procurement by the budget year; to determine the type of procurement action to be initiated; and to initiate a realistic plan for satisfying the fleet requirement for SE end items.

The equipments to be procured are determined through one of the following processes:

1. The direct result of the SE RDT&E Program (these are equipments required to support advanced aircraft systems developments).
2. Reprourement of current SE required to respond to deficiencies.
3. Improved versions of current SE required to support expanded airborne equipment capabilities or advanced airborne equipment developments (e.g., Mobile Electric Power Plant).
4. Major modifications of existing equipments (e.g., Engine Test Stand Update).
5. Equipment developed to improve the capability of the Fleet and/or to improve safety.

To fill the minimum acceptable level of established requirements, budget authority for \$117.0 million in FY 1986 and authorization for \$119.4 million in FY 1987 is requested.

#### Mobile Maintenance Facilities

Budget authority of \$14.1 million in FY 1986 and authorization for \$20.2 million in FY 1987 for Mobile Maintenance Facilities are requested. This program provides for the acquisition of Mobile Facilities and related equipment to support Marine Corps Expeditionary Force and Navy contingency/mobilization aircraft and weapon system maintenance operations. The concept is to provide rapid-response mobility by the use of relocatable maintenance shelters. Execution of the Marine Corps Aviation mission is dependent on a highly mobile and functionally independent aircraft maintenance support capability.

The basic equipments procured under this subtitle item are the container (VAN), air conditioner, 60-Hertz electric generator, running gear and static converter 60 Hz to 400 Hz. The Navy requirement is driven by the P-3C Contingency/Augmentation Mobile Maintenance Support System (C/AMMSS).

#### ICP Managed SE

ICP Managed SE funds the procurement of end items of Peculiar Support Equipment (PSE) for out-of-production aircraft and systems, and Common Support Equipment (CSE) which are under the procurement and inventory control of the Aviation Supply Office (ASO), Philadelphia, and the Ships Parts Control Center (SPCC), Mechanicsburg, PA. CSE end items are normally introduced into the Fleet thru NAVAIR development and initial procurement. The items are turned over to ASO or SPCC inventory management as an Inventory Control Point (ICP) item after the production specification and procurement

package have been stabilized. Most PSE items are assigned to ASO management from the outset. These items are associated with a weapon system and are recommended by the aircraft or airborne system contractor, reviewed and approved by the Navy, and assigned to ASO for procurement and inventory management.

The budget requirements for this element are categorized as follows:

- a. New CSE required for site outittings incident to employment of new weapon systems or equipments.
- b. Replacement CSE resulting from wear-out and attrition.
- c. Increased quantities of CSE required for allowance augmentation.
- d. Increased quantities for out-of-production aircraft and systems required due to changes in base-loading beyond original planning or changes in maintenance policy.
- e. Replacement PSE due to attrition.

These "principal" items managed by the ICPs with no demand or usage criteria, and require more selective management: attention than do the ICP secondary items (spare and repair parts). Sample SE end items procured under this sub-line item include aircraft jacks, aircraft tow bars, hoisting slings, armament handling equipment and maintenance platforms. This program funds the acquisition of some 11,000 individual models of CSE and PSE with an inventory value nearing \$4.0 billion.

To support this program, \$99.2 million in FY 1986 and authorization for \$107.8 million in FY 1987 are requested.

#### Headquarters Managed Peculiar Support Equipment

This budget subline provides funds to replace certain in-use Peculiar Support Equipment (PSE) assets of the late 1960 and early 1970 vintage that are now marginally effective due to obsolescence or for which logistic support is not available because the applicable vendors no longer manufacture the items or its associated repair parts. Alternate sources are not available. As a consequence, a replacement item that is logistically supportable must be designed and produced. In addition, this subline provides for modification of PSE to extend its useful service life.

Budget authority of \$23.3 million in FY 1986 and authorization for \$23.6 million in FY 1987 is requested for this program.

#### Gas Turbine Compressor Replacement

The FY 1986 budget request of \$16.2 million and the FY 1987 authorization request of \$7.9 million will finance the acquisition of new GTC equipments: to replace existing mobile/turbine-powered air start units at all Navy/Marine Corps activities. Currently, 60 shorebased activities and 15 carriers must be supported with air start systems. Present units average 25 years in age and suffer from poor maintainability and reliability. The acquisition of new, more reliable equipment will enable the Navy to meet its vital support requirements.

#### Avionics Support Equipment

The FY 1986 budget request of \$44.3 million and the FY 1987 authorization request of \$45.2 million will provide for the acquisition of several common avionic support equipment items; the Armament Programmable Test Set (APTS), the AN/USM-406(V) Countermeasure Test Set, a state-of-the-art Radar Beacon Test Set, the AN/USM-482 Swept Frequency Measurement Test Set and the AN/ASM-607 Memory Loader Verifier. The APTS is a multi-application, microprocessor-controlled test set for support of Missile Launchers, MERS/TERS, and Bomb Racks (conventional and nuclear). The AN/USM-406(V) is a newly-configured electronic warfare counter-measures test set used in organizational level maintenance support of a variety of EW equipments. The new Radar Beacon Test Sets will replace 20 year old test sets and will provide rapid organizational level testing of Automatic Carrier Landing Systems. The new Swept Frequency Measurement Test Sets will provide the capability to troubleshoot RF transmission lines and perform distance-to-fault measurements. The Memory Loader Verifier is a micro-processor controlled mass storage unit utilized to load and verify Operational Flight Programs into aircraft processor/computer units.

#### Rapid Deployment Force/Maritime Prepositioned Ships

The FY 1986 budget request of \$7.7 million and the FY 1987 authorization request of \$7.8 million will fund support equipment for the new Rapid Deployment Force. Common Support Equipment (CSE), Armament-Handling Equipment (AHE), organizational-level Peculiar Support Equipment (PSE) and selected intermediate level PSE will be procured to support a variety of fixed-wing and rotary-wing aircraft. The equipment procured in FYs 1985 and FY 1986 will support the outfitting of the second and third Marine Amphibious Brigades (MABs). The support equipment items will be stored on USMC Maritime Prepositioning Ships (MPS) at various locations throughout the world.

#### Aircraft Salvage Equipment

The budget request of \$.8 million in FY 1986 and the authorization request of \$9.6 million in FY 1987 will provide for the replacement of existing NS-60 aircraft crash cranes which have been deployed for over 13 years aboard the Navy's CV class carriers, and the HCC-30/50 crash cranes which have been deployed for 14 years aboard LHA/LPH/LPD class ships. During this time, the weight and size of deployed aircraft have increased, such that they exceed the maximum



lifting/mobility requirements of these cranes. Aircraft crash removal is seriously debilitated creating an unacceptable operational readiness impact. Further, the aging NS-60 and HCC 30/50 cranes have experienced declining reliability, maintainability and supportability which have seriously degraded their operational effectiveness. A four-year multiyear production contract will be competitively awarded in FY 1985 for 34 CV/AACC crash cranes with deliveries commencing in FY 1987.

#### Maintenance Information Automated Retrieval System (MIARS)

The FY 1986 budget request for MIARS is \$1.5 million and the FY 1987 authorization request \$1.4 million. The MIARS program is designed to meet the objective of converting the existing NAVAIR technical manual inventory from paper to microfilm. The program provides for the progressive conversion to a manageable 16MM microfilm data base, investigates the compatibility of information to insure adequate presentation techniques and data integrity, and controls the procurement of specialized update and reading equipment for the enhancement of fault isolation and repair through the use of automated rapid retrieval equipment. The present request will permit continued support of total fleet requirements as identified by a fleet survey.

#### Engineering Data Management Information Control Systems (EDMICS)

The object of the Engineering Data Management Information Control System (EDMICS) Program, is to provide more timely and complete engineering data and drawings to the Naval Air Rework Facilities (NAVIREWORKFACS) for support of weapons system and component maintenance and overhaul and to the Aviation Supply Office (ASO) for competitive procurement support. To this end the \$0.9 million required in FY 1986 and the \$0.9 million authorization required in FY 1987 will procure the basic hardware system and peripheral equipment to be used in the electromechanical handling, manipulation, reproduction and electronic submission of actual graphic data (microfilm copy of drawings). Since the primary reason reported by auditing agencies for noncompetitive procurement at ASO is lack of technical data, acquisition of this equipment will substantially alleviate this problem by providing rapid access to the massive technical data bank located at the Naval Air Technical Services Facility (NATSF), Philadelphia.

Aircraft Industrial Facilities -- FY 1986 \$57.1 million; FY 1987 \$59.9 million

The FY 1986 budget request for Aircraft Industrial Facilities is \$57.1 million and the FY 1987 authorization request is \$59.9 million. These funds are required for the following categories of equipment:

	(Dollars in Millions)
FY 1986	FY 1987
Calibration Equipment	\$40.1
Contractor Facilities	17.0
	\$38.3
	21.6
Total Aircraft Industrial Facilities	\$57.1
	\$59.9

#### Calibration Equipment

The calibration program provides the fleet with a means to ensure that Support Equipment (SE) is operational and accurate. Calibration is the process of periodically comparing the performance of items of SE to that of equipment of higher accuracy and making adjustments to the SE equipments as required.

Calibration funds are used to procure the initial outfitting of calibration standards and ancillary equipment required to support SE. Items procured with these funds are used at approximately 100 fleet "I" level calibration activities, 30 NAVAIR calibration laboratories and annexes, five NAVAIR standards laboratories and the Metrology Engineering Center (MEC).

Standards for "I" level fleet calibration activities are used to expand capabilities, replace time-worn and obsolete equipment, improve performance, and reduce man-hour efforts. Standards procured for the depot level calibration and standards laboratories are used to automate and improve certain calibration procedures in order to reduce man-hour requirements and to expand calibration capabilities to additional laboratories.

Budget authority of \$40.1 million is requested for FY 1986 and authorization for \$38.3 million in FY 1987 is requested for this program.

#### Contractor Facilities

The FY 1986 budget request of \$17.0 million for Contractor Facilities and the FY 1987 authorization request of \$21.6 million will provide:

- (a) Capital maintenance, modernization, improvements, emergency repairs and fire protection for government-owned, aircraft-producing industrial plants. Facilities management contracts require that the government fund capital maintenance projects as required. These projects apply at Naval Weapons Industrial Reserve Plants (NWIRPs) at Bloomfield, Conn.; Dallas, Texas; Bethpage, New York; and St. Louis, Missouri.
- (b) Replacement/restoration and capital maintenance of government-owned production equipment in use on Navy programs. Inefficient equipment is replaced when the contractor is unwilling or unable to fund the project or the projects will reduce end-item costs to the government and improve the industrial readiness posture, or when capital maintenance is required in accordance with contractual obligation. New machine tools procured are peculiar to the aerospace industry, producing complex aerospace parts at reduced costs. The reduced costs permit recovery of the investment in three and one-half years.
- (c) Procurement of additional production facilities to support programs for new weapons systems and/or to expand present production capabilities that are not supported by private enterprise.

All of the above must include provisions for compliance with the Occupational Safety and Health Act of 1970, P.L. 91-596, and the Environmental Protection Act as implemented by DOD Instruction 5030.52, 28 April 1972.

War Consumables - FY 1986 \$55.0 million; FY 1987 \$47.9 million

The FY 1986 budget request of \$65.0 million and the FY 1987 authorization request of \$47.9 million provide for procurement of bomb racks, Improved Multiple Ejection and Triple Ejection Racks (IMER-ITERS), external fuel tanks, and fuel tank modifications. The procurement programs for these items will buy increments of inventory objectives which are determined by such factors as the numbers and types of using aircraft, the mission of aircraft, and attrition and pipeline requirements. The following items are requested:

	FY 1986		FY 1987	
	Qty	Amt	Qty	Amt
Air Refueling Stores	99	\$41,000	99	\$41,700
BRU-41/42 (IMER/ITER) Retrofit	-	21,020	-	3,531
300-Gallon Ext. Fuel Tanks	281	1,375	221	1,045
100-Gallon Ext. Fuel Tanks	14	87	-	-
Launcher Rack Retrofit	-	1,000	-	1,050
Production/Engineering Support	-	560	-	600
Total		\$65,042		\$47,926

Other Production Charges - FY 1986 \$57.7 million; FY 1987 \$62.1 million

The FY 1986 budget request for Other Production Charges is \$57.7 million. The FY 1987 authorization request is \$62.1 million. These funds will provide the following:

- (a) \$26.0 million in FY 1986 and \$22.0 million in FY 1987 for Government-Furnished Equipment (GFE) production support which includes testing services, production data reviews, technical publications, repair of damaged or defective GFE, and procurement of Navy Stock Fund items necessary for fleet installation of technical directives (i.e., minor modification kits and other hardware changes).
- (b) \$10.1 million in FY 1986 and \$7.4 million in FY 1987 for procurement of certain Navy avionics equipment for installation in Coast Guard aircraft.
- (c) \$11.6 million in FY 1986 and \$14.4 million in FY 1987 for procurement of reconnaissance and other aerial cameras.
- (d) \$1.5 million in FY 1986 and \$1.3 million in FY 1987 for procurement of instrumentation packages used by aircraft participating in Mobile Sea Range exercises.
- (e) \$13.6 million in FY 1986 funding and \$17.0 million in FY 1987 for pods for the Tactical Aircrew Combat Training System (TACTS).

COMPARISON OF FY 1985 PROGRAM REQUIREMENTS AS REFLECTED IN FY 1985  
PRESIDENT'S BUDGET WITH FY 1985 PROGRAM REQUIREMENTS SHOWN IN FY 1986 PRESIDENT'S BUDGET

	(In Thousands of Dollars)			
	Total Program Requirements per 1985 Budget	Total Program Requirements per 1986 Budget	Increase (+) or Decrease (-)	
Combat Aircraft.....	\$ 6,823,819	\$ 6,501,660	-\$322,159	
Airlift Aircraft.....	251,311	246,206	- 5,105	
Trainer Aircraft.....	91,155	141,160	+ 50,005	
Other Aircraft.....	-	86,900	+ 86,900	
Modification of Aircraft.....	1,919,506	1,711,763	- 207,743	
Aircraft Spares and Repair Parts.....	1,609,734	1,534,496	- 75,238	
Aircraft Support Equipment and Facilities.....	778,675	681,613	- 97,062	
Reimbursable Program.....	40,000	8,000	- 32,000	
TOTAL FISCAL YEAR PROGRAM.....	\$11,514,200	\$10,911,798	-\$602,402	

EXPLANATION BY BUDGET ACTIVITY

Combat Aircraft (-\$322.2 million)

The changes in this budget activity are primarily associated with the following Congressional action including application of general and consultant services reductions:

Program	Amount	Quantity	Amount
A-6E	-\$15.3		- 26.3
A-6E Adv. Proc.	+ 15.1		- 33.5
AV-8B	- 35.8	+ 6	+ 41.1
AV-8B Adv. Proc.	- 20.4		+ 5.5
F-14A	- 15.9		- 58.5
F-14 Adv. Proc.	- 5.0		- 36.1
F/A-18	- 55.6		- 6.0
F/A-18 Adv. Proc.	-130.2	+ 6	-\$276.9

Proposed DD 1415 Reprogramming Actions within this budget activity include the following:

<u>Program</u>	<u>Amount</u>
A-6E Adv. Proc.	- \$ 3.7
AV-8B Adv. Proc.	+ 20.4
CH-53E	- 1.8
P-3C Adv. Proc.	+ 39.0
SH-2F	- 4.5
SH-2F Adv. Proc.	+ 4.5

Other actions include increases of \$2.6 million and \$2.7 million for EA-6B and CH-53E respective advance procurement requirements and \$.3 million for minor adjustments to the AV-8B and decreases of \$4.5 million to the AH-1T due to reduced support equipment site requirements and \$.2 million and \$.1 million of miscellaneous pricing adjustments to the A-6E advance procurement and P-3C accounts.

Airlift Aircraft (-\$5.1 million)

Reduction of \$5.1 million by Congressional action to the UC-12B aircraft is the only change to this budget activity.

Trainer Aircraft (+\$50.0 million)

Change in this budget activity was due to Congressional action adding 2 ADVERSARY aircraft and \$50 million.

Other Aircraft (+\$86.9 million)

Congressional changes in this budget activity are the following:

<u>Program</u>	<u>Quantity</u>	<u>Amount</u>
KC-130T	+2	+\$48.0
UH-60A	+2	+ 12.0
	+4	+\$60.0

Additionally a DD 1415 Reprogramming Action is being submitted for advance procurement requirements totalling \$26.9 million for 9 VH-60 aircraft budgeted in FY 1986.

Modification of Aircraft (-\$207.7 million)

Congressional action resulted in a net \$182.1 million reduction. Specific adjustments by program are listed below:

<u>Program</u>	<u>Amount</u>
F-14 Series	+68.0
F-18 Series	-6.9
P-3 Series	+12.1
S-3 Series	-8.1
E-2 Series	-4
EC-130 Series	-3.9
Various Mod	-11.0
Common ECM	-30.6
Penguin (SH-60 Series)	+11.7
	<u>+\$10.9</u>

Offsetting the Congressionally directed increase to the above programs was a \$200.0 million general reduction which was assessed as follows:

<u>Program</u>	<u>Amount</u>
A-4 Series	-\$4
F-4 Series	-1.7
F-14 Series	-29.5
F-5 Series	-2.1
F-18 Series	-6.0
H-46 Series	-9.0
H-1 Series	-18.6
H-2 Series	\$-2.2
H-3 Series	-6.0
E-2 Series	-19.7
EC-130 Series	-2.4
C/KC-130 Series	-5.8
Power Plant Changes	-2.6
Common ECM	-94.0
	<u>-\$200.0</u>

In addition to the Congressional action reflected above, other decreases include: \$3.7 million in the A-6 series due to a reduction in procurement of SLEP/Rewing kits; \$9 million in the F-5 series resulting from reduction in Structural Fatigue modification requirements; \$3.3 million in H-3 series due to repricing of the SLSP effort; \$13.3 million in the P-3 series reflecting a reduction in triple vernier requirements in the AQA-7 improvements modification and repricing of the ASP program; \$2.5 million in the S-3 series due to an administrative transfer of the SCADC modification program to the Common Avionics series; \$2.0 million in the Safety modification series due to improved aircraft safety performance; and general repricing in several modification series including the F-4 (\$1.1 million), C/KC-130 (\$1.1 million), Common ECM (\$1.1 million), E-2 (\$1.1 million), EC-130 (\$1.1 million) and miscellaneous programs (\$2.2 million).

Partially offsetting these decreases are the following increases: \$1.6 million in the A-7 series to initiate the Aircraft Rewire SLEP program; \$1.1 million in the H-1 series due to repricing of several modifications; \$3.3 million in the TH-57 series reflecting additional requirements in the Configuration Update program; \$2.2 million in the Trainer series to accommodate a general repricing; and \$2.6 million in the Common Avionics series resulting from the administrative transfer of the SCADC program from the S-3 series to the Digital Air Data Converter program budgeted in the Common Avionics account and repricing of other programs.

#### Aircraft Spares and Repair Parts (-\$75.2 million)

The change in this budget activity results from application of \$9.3 million of the Congressional general reduction to replenishment spares, transfer out of initial spares by reprogramming proposed to fund advance procurement requirements, and an increase due to higher ASO requirements in replenishment.

#### Aircraft Support Equipment and Facilities (-\$97.1 million)

The adjustment due to Congressional action in this budget activity was reduction of the Common Ground Equipment account by \$100 million. Additionally, there has been \$2.0 million transferred on a proposed reprogramming to fund aircraft advance procurement requirements. Offsetting these decreases are increases of \$9.9 million for minor repricing in Common Ground Equipment and \$4.0 million to Other Production Changes for rephased Coast Guard requirements.

#### Reimbursable Program (-\$32.0 million):

The decrease in the reimbursable program reflects the shift of replenishment spares/depot level repairables procurement to the Navy Stock Fund (NSF). Since most sales are spare parts, the reimbursement and replacement of sales would involve the NSF rather than the Aircraft Procurement, Navy appropriation.

COMPARISON OF FY 1985 FINANCING AS REFLECTED  
IN FY 1985 BUDGET WITH FY 1985 FINANCING AS  
SHOWN IN FY 1986 BUDGET

	(In Thousands of Dollars)		
	Financing Per FY 1985 Budget	Financing Per FY 1986 Budget	Increase (+) or Decrease (-)
Program Requirements (Total).....	\$11,514,200	\$10,911,798	-\$ 602,402
Program Requirements (Service account).....	11,474,200	10,903,798	- 570,402
Program Requirements (Reimbursable).....	40,000	8,000	- 32,000
Less:			
Anticipated Reimbursements.....	40,000	8,000	- 32,000
Reprogramming from prior year budget plans.....			
Unobligated balance available from prior year to finance new budget plans.....			
Transferred from other accounts.....			
Add:			
Unobligated balance available to finance subsequent year budget plans.....			
Transferred to other accounts.....			
Appropriation.....	\$11,474,200	\$10,903,798	-\$ 570,402

EXPLANATION OF CHANGES IN FINANCING

The decrease in program requirements is the result of congressional reductions of \$570,402,000 from the requested amount to the amount appropriated including distribution of the revised budget amounts of May 1984 and general Congressional assessments.



COMPARISON OF FY 1984 PROGRAM REQUIREMENTS AS REFLECTED IN FY 1985  
PRESIDENT'S BUDGET WITH FY 1984 PROGRAM REQUIREMENTS SHOWN IN FY 1986 PRESIDENT'S BUDGET

	(In Thousands of Dollars)		Increase (+) or Decrease (-)
	Total Program Requirements per 1985 Budget \$ 6,026,598	Total Program Requirements per 1986 Budget \$ 5,992,652	
Combat Aircraft.....	180,008	182,000	+ 1,992
Airlift Aircraft.....	64,432	63,132	- 1,300
Trainer Aircraft.....	165,066	165,066	-
Other Aircraft.....	1,352,297	1,384,202	+ 31,905
Modification of Aircraft.....	1,963,199	1,939,428	- 23,771
Aircraft Spares and Repair Parts.....	413,008	431,128	+ 18,120
Aircraft Support Equipment and Facilities.....	40,000	40,825	+ 825
Reimbursable Program.....	\$10,204,602	\$10,198,433	-\$ 6,175
TOTAL FISCAL YEAR PROGRAM.....			

EXPLANATION BY UDGET ACTIVITY

Combat Aircraft (-\$33.9 million)

Reductions include \$5.0 million from the AV-8B on DD 1415 Reprogramming Action; \$21.2 million from the F-14A and \$11.0 million from the CH-53E based on: airframe and engine contract savings; \$3.0 million from the SH-2F due to lower than anticipated GFE prices and reduced support requirements; and \$0.7 million, \$2.9 million, \$1.0 million, \$0.1 million and \$0.4 million from the AV-8B, F/A-18, SH-60B, P-3C and E-2C respectively for fair share cost of a new AN/AYK-14 source.

Increases include \$0.9 million for higher than expected costs for F-14 advance procurement GFE requirements, \$3.2 million for additional CH-53E advance procurement long lead airframe components, and \$7.3 million for additional E-2C support equipment requirements.

Airlift Aircraft (+\$2.0 million)

An increase of \$2.0 million in the C-2A program has occurred because of additional engine support equipment and training equipment requirements.

Trainer Aircraft (-\$1.3 million)

The decrease in this budget activity is due to changes in support requirements for the TH-57 program.

Modification of Aircraft (+\$31.9 million)

Changes include the following increases: \$14.8 million in the A-6 series to procure twelve additional Rewing kits; \$9.0 million in the A-7 series to accelerate procurement of IMER/ITER pylon cables and to cover increased costs associated with the AN/ASN-90, FLIR and TF-41 HELP programs; \$3.0 million in the EA-6 series to cover cost growths in the AN/ALQ-99 Pods procurement; \$6 million in the RF-4 series to increase funding for the APQ-99 Update; \$13.2 million in the F-14 series to exercise an option for additional TF-30 Engine Improvement kits and to continue the LINK-4A program; \$1.8 million in the F-18 series to increase funding for Correction of Discrepancies and to accelerate procurement of the AN/AYK-14; \$6.2 million in the H-46 series to exercise a favorably priced option for AN/ALQ-157 jammers and to procure Strike University modifications; \$2.6 million in the H-53 series to procure AN/APN-217 systems for RH-53D helicopters to meet a deployment; \$2.7 million in the H-2 series to accelerate procurement of ALR-66 kits; \$8.6 million in the H-3 series for VH-3D modifications and to cover Main Gearbox pricing adjustments; \$32.8 million in the EP-3 series to increase the Sensor Update/CILOP program (a DD 1415 reprogramming action); \$2.3 million in the S-3 series to cover cost increases in the APU increased power effort; \$2.6 million in the C-9 series for C-9B Executive aircraft modifications and related communications improvements; \$2.6 million in the C/KC-130 series to procure Strakes, an operational improvement modification initiated by the U.S. Air Force; \$1.7 million in the FEWSG series to increase the ERA-3B ESM receiver system program; and finally, \$1.0 million in the Various line, \$1.4 million in the T-2 series, \$3.3 million in the T-39 series, and \$2.2 million in the Common Avionics item for miscellaneous price adjustments.

The above increases are partially offset by the following decreases: \$2.1 million in the F-4 series due to reduced requirements for AWG-10A kits; \$19.3 million in the H-1 series resulting from developmental delays and programmatic slippage in the HELLFIRE, AN/APR-14 and AN/ALQ-136 programs; \$5.8 million in the P-3 series recognizing lower-than-anticipated costs for LTN-72 AFC kits; \$14.6 million in the E-2 series resulting from a favorable price on the Grumman Omnibus modification contract, an umbrella contract that includes most airframe modifications and the TRAC-A radar antenna; \$1.6 million in the TH-57 series resulting from programmatic slippage in the Anti-Collision Strobe Lights and ECS/YAW modifications; \$2.2 million in the Power Plant changes line due to delayed order placement resulting from compliance with the administrative requirements of PL 98-72; \$28.5 million in the Common ECM item due to contract savings on the AN/ALR-45F effort and through reduced AN/ALQ-126B requirements following the effective utilization of prior year funds; \$3.9 million in the Flight Safety series due to improved safety performance; and \$5.5 million in the C-131 series, \$4.4 million in the US-3 series, \$5.2 million each in the F-8 and UC-12 series and \$1.1 million each in the T-44 and C-1 series due to miscellaneous pricing adjustments.

Aircraft Spares and Repair Parts (-\$23.8 million)

The changes in this budget activity consist of a decrease in initial spares requirements of \$107.2 million and an increase to replenishment spares of \$83.4 million for a net decrease of \$23.8 million.

Of the decreases in initial spares, \$2.0 million was an additional amount on a Reprogramming Action transferring funds out of the appropriation to O&MN for Buy Our Spares Smart (BOSS). Other changes include savings in Pratt & Whitney engines (-\$13.0 million) and decreased or rephased requirements in AV-8B contractor parts (-\$20.3 million), PGSE (-\$26.2 million), training devices spares (-\$19.1 million), modification spares (-\$11.6 million), KC-130 spares (-\$5.7 million) and F/A-18 Navy parts (-\$9.3 million).

Increases of \$83.4 million are due to acceleration in requirements in replenishment spares determined by the aviation Supply Office (ASO).

Aircraft Support Equipment and Facilities (+\$18.1 million)

Increases of \$8.8 million and \$9.3 million to Common Ground Equipment and Other Production Charges respectively reflect acceleration and higher than anticipated prices in the EDMICS program, increased requirements for EW Training Complexes and TACTS pods, production startup and support of a new AN/AYK-14 source, rephasing of Coast Guard procurements, and emergent on-board visual and camera equipment requirements.

Reimbursable Program (+\$.8 million):

The increase in the reimbursable program reflects a higher level of actual orders received rather than those anticipated in last year's budget submission.

COMPARISON OF FY 1984 FINANCING AS REFLECTED  
IN FY 1985 BUDGET WITH FY 1984 FINANCING AS  
SHOWN IN FY 1986 BUDGET

	(In Thousands of Dollars)		
	Financing Per FY 1985 Budget	Financing Per FY 1986 Budget	Increase (+) or Decrease (-)
Program Requirements (Total).....	\$10,204,608	\$10,198,433	-\$ 6,175
Program Requirements (Service account).....	10,164,608	10,157,608	- 7,000
Program Requirements (Reimbursable).....	40,000	40,825	+ 825
 Less:			
Anticipated Reimbursements.....	40,000	40,825	+ 825
Reprogramming from prior year budget plans.....			
Unobligated balance available from prior year to finance new budget plans.....			
Transferred from other accounts.....			
 Add:			
Unobligated balance available to finance subsequent year budget plans.....	10,000	17,000	- 7,000
Transferred to other accounts.....			
Appropriation.....	\$10,174,608	\$10,174,608	-

EXPLANATION OF CHANGES IN FINANCING

While there has been no change in the amount appropriated, there has been a \$6,175,000 decrease in program requirements which resulted from an additional \$7,000,000 transferred out of the appropriation by DD 1415 Reprogramming Action and an increase of \$825,000 based on actual reimbursable transactions.

Status of Aircraft Modification Programs  
FY 1985 Modification of Aircraft  
 Programs as of 30 November 1984

(Thousands of Dollars)

Program	<u>Appropriated 1/</u>	<u>Reprogramming</u>	<u>Program Value 2/</u>	<u>Total Obligations</u>	<u>Total Expenditures</u>
	5,701		5,701		
A-3 Series	21,465	- 48	21,417		
A-4 Series	149,395	- 3,690	145,705	128	
A-6 Series	79,635	-	79,635		
EA-6 Series	74,993	+ 1,563	76,556		
A-7 Series	15,382	-	15,382		
AV-8A	3,335	- 95	3,240		
F-4 Series	6,246	-	6,246		
RF-4 Series	241,748	-	241,748	4,514	
F-14A	175	-	175		
F-8 Series	1,527	- 900	627		
F-5 Series	47,030	- 36	46,994		
OV-10A	27,319	- 45	27,273		
F-18 Mods	148,534	- 36	148,498	69	
H-46 Series	44,444	-	44,444		
H-53 Series	11,700	-	11,700		
SH-60 Penguin Mods	78,084	+ 104	78,188		
H-1 Series	13,596	- 3	13,593		
H-2 Series	104,653	- 296	104,357		
H-3 Series	177,477	- 13,321	164,156		
P-3 Series	155,553	- 2,500	153,053		
S-3	2,447	-	2,447		
US-3A (COD)	54,612	- 56	54,556		
E-2 Series	7,883	+ 162	8,045		
Trainer A/C Series	745	+ 295	1,040		
T-57	27,688	- 85	27,603		
FC-130 Series	14,081	- 91	13,990		
C-130 Series	34,548	-	34,548	27,621	
FEWSG	4,386	-	4,386		
Cargo Transport A/C					

Status of Aircraft Modification Programs				(Thousands of Dollars)
FY 1985 Modification of Aircraft				
Programs as of 30 November 1984				
Program	Appropriated 1/	Reprogramming	Program Value 2/	Total Obligations
				Total Expenditures
Various	13,173	-	13,173	
Power Plant Changes	10,454	- 10	10,444	
Misc Safety Changes	6,955	- 2,000	4,955	
Common ECM Equipment	120,243	- 143	120,100	320
Common Avionics Changes	25,187	+ 2,601	27,788	
TOTAL B.A. 5	1,730,394	- 18,631	1,711,763	32,652

1/Includes distribution of the general modification reduction  
2/FY 1985 Column of FY 1986 President's Budget

Status of Aircraft Modification Programs  
FY 1984 Modification of Aircraft  
Programs as of 30 November 1984

(Thousands of Dollars)

Program	Appropriated 1/ Value	Reprogramming	Total Program 2/ Value	Total Obligations	Total Expenditures
A-3 Series	3,996	+ 2,433	6,429	1,992	10
A-4 Series	14,624	+ 1,089	15,713	5,135	422
A-6 Series	143,065	+ 11,838	154,903	110,322	24,364
EA-6 Series	74,072	+ 2,544	76,616	41,231	4,607
A-7 Series	127,224	+ 8,506	135,730	62,090	6,188
AV-8A	3,333	-	3,333	1,299	219
F-4 Series	17,637	- 1,417	16,220	8,661	575
RF-4 Series	8,358	+ 9,395	17,753	10,834	901
F-14A	162,334	+ 12,682	175,016	167,595	43,432
F-8 Series	200	- 156	44	44	41
F-5 Series	1,748	-	1,748	241	-
OV-10	8,577	- 120	8,457	3,659	120
F-18 Series	29,681	+ 797	30,478	20,369	4,611
H-46 Series	116,175	+ 6,220	122,395	115,032	7,123
H-53 Series	20,653	+ 2,600	23,253	16,903	185
H-1 Series	38,823	- 19,596	19,232	10,219	368
H-2 Series	11,013	+ 2,918	13,931	12,698	566
H-3 Series	54,562	+ 8,643	63,205	56,898	7,795
EP-3 Series	26,659	+ 20,868	45,727	-	-
P-3 Series	147,501	+ 10,859	158,360	112,530	14,105
S-3A	34,833	+ 2,535	37,368	31,163	2,598
US-3	1,060	- 482	578	553	34
E-2 Series	60,512	- 18,469	42,043	40,104	32
T-38 Series	500	-	500	-	-
T-34 Series	257	- 257	-0-	-	-
T-44	100	- 100	-0-	-	-
T-39 Series	437	- 162	275	-	-
TH-57	2,037	- 2,037	-0-	-	-
T-2	542	+ 96	638	209	-

Status of Aircraft Modification Programs  
FY 1984 Modification of Aircraft  
Programs as of 30 November 1984

(Thousands of Dollars)

<u>Program</u>	<u>Appropriated 1/</u>	<u>Reprogramming</u>	<u>Total Program 2/ Value</u>	<u>Total Obligations</u>	<u>Total Expenditures</u>
C-9 Series	2,017	+ 2,498	4,515	1,954	959
C-1A	120	- 72	48	8	-
C-2	660	-	660	463	56
UC-12	300	- 287	13	-	-
EC-130 Series	12,286	- 2,298	9,988	6,321	3,441
C/KC-130 Series	13,888	+ 2,424	16,312	11,932	225
FEWSG	30,079	+ 1,565	31,644	29,596	2,917
C-131	2,735	- 450	2,285	2,085	627
Various	7,875	+ 970	8,845	7,849	52
Power Plant Changes	11,907	- 2,748	9,159	2,349	195
Misc. Safety Changes	6,007	- 3,937	2,070	1,062	176
Common ECM Equipment	144,172	- 28,538	115,634	10,089	1,044
Common Avionics Changes	12,763	+ 321	13,084	5,782	658
<b>TOTAL B.A. 5</b>	<b>1,353,527</b>	<b>+ 30,675</b>	<b>1,384,202</b>	<b>909,271</b>	<b>128,646</b>

1/ Includes distribution of the reduced escalation budget amendment and general congressional assessments.

2/ FY 1984 Column of FY 1986 President's Budget.



Status of Aircraft Modification Programs  
FY 1983 Modification of Aircraft  
 Programs as of 30 November 1984

(Thousands of Dollars)

Program	Appropriated 1/	Reprogramming	Total Program Value	Total Obligations	Total Expenditures
A-1 Series	7,300	+ 1,677	8,977	8,623	4,018
A-2 Series	24,723	+ 1,597	26,320	25,345	16,325
A-4 Series	175,345	- 39,820	135,525	132,912	52,120
EA-6 Series	85,177	- 200	84,977	72,428	31,670
A-7 Series	95,400	+ 132	95,532	82,708	38,020
AV-8A	10,900	+ 427	11,327	11,153	314
F-4 Series	22,700	+ 362	23,062	21,702	12,689
RF-4 Series	29,470	- 809	28,661	24,935	7,825
F-14A	141,924	+ 971	151,895	150,396	114,433
F-8 Series	1,200	- 495	705	699	249
F-5 Series	200	+ 10	210	200	42
OV-10	1,700	- 1,665	35	33	33
F-18 Series	4,981	+ 7,219	12,200	12,056	7,835
H-46 Series	51,000	+ 6,010	57,010	55,747	24,948
H-53 Series	21,479	- 8,034	13,445	11,923	3,106
H-1 Series	18,900	- 4,811	14,089	13,065	5,269
H-2 Series	3,900	+ 254	4,154	3,756	2,572
H-3 Series	20,600	+ 5,804	26,404	26,388	18,151
EP-3 Series	28,200	- 2,578	25,622	24,088	2,850
P-3 Series	116,390	+ 335	116,725	111,356	58,239
S-3A	26,152	- 201	25,951	23,765	7,703
US-3	92	- 92	-	-	-
E-2 Series	44,887	- 8,424	36,463	36,431	11,031
T-34 Series	1,500	- 1,385	115	3	-
T-44 Series	200	- 155	45	23	23
T-39 Series	500	- 776	724	707	445
TH-57	0	- 300	-	-	-
T-2	0	- 25	75	71	46
C-9 Series	1,400	- 234	1,166	198	15

Status of Aircraft Modification Programs  
FY 1983 Modification of Aircraft  
 Programs as of 30 November 1984

(Thousands of Dollars)

<u>Program</u>	<u>Appropriated 1/</u>	<u>Reprogramming</u>	<u>Total Program Value</u>	<u>Total Obligations</u>	<u>Total Expenditures</u>
C-1A	200	- 200	-	59	25
UC-12	200	- 130	/0		15,311
EC-130 Series	50,079	- 6,825	43,254	38,097	4,051
C/KC-130 Series	15,187	- 2,890	12,297	11,057	10,784
FEWSG	33,900	+ 7,625	41,525	40,349	59
C-131	100	+ 25	125	117	5,239
Various	10,800	+ 1,298	12,098	12,092	2,156
Power Plant Changes	11,700	- 502	11,198	7,736	1,774
Misc. Safety Changes	5,400	+ 551	5,951	5,841	36,598
Common ECM	139,763	- 6,615	133,148	88,214	2,872
Common Avionics	5,858	+ 3,126	8,984	8,307	
TOTAL B.A. 5	1,210,807	- 40,743	1,170,064	1,062,580	498,840

1/ Includes application of Consultants, Studies and Analyses, BP/IR&D, and General Modification Reductions.

FY 1986 CONGRESSIONAL APN INDEX

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5-7 86-05 Communications and Intercom. System Update (EA-3B, TA-3B, ERA-3B, KA-3B, NRA-3B, VA-3B, RA-3B, NA-3B, A-3B)

A-4 Mod - P-1 Line Item 43

5-9 4-83 AN/ALQ-152 Countermeasures Set Provisions (A-4M)  
5-11 6-83 AN/ARN-118 TACAN (TA-4F/TA-4J)  
5-13 129-83 Constant Frequency Generator Improvement Program (TA-4F/J)  
5-14 64-85 AN/ARC-159(V)5 UHF Transceiver (TA-4J)  
5-15 65-85 AN/APN-194 Radar Altimeter System (TA-4F/J)  
5-17 67-85 AN/APR-43 Provisions (A-4M)

A-6 Mod - P-1 Line Item 44

5-18 1-76 Target Recognition and Attack Multisensor (TRAM) (A-6E)  
5-20 9-77 ASN-92 (CAINS) and CNI Combined (Configuration Update) (A-6E)  
5-22 1-78 AN/IP-722F Vertical Display Indicator (VDI) (A-6E/KA-6D)  
5-24 102-80 Weapon Control System Improvement (A-6E)  
5-26 5-82 Reliability, Maintainability (R&M) and Service Life Extension Program (SLEP) (KA-6D)  
5-28 8-83 Weapons Integration (A-6E)  
5-29 9-83 Radar Data Converter Improvements (A-6E,  
5-30 51-84 AN/ALR-67 Radar Receiving Set, Countermeasures (A-6E)  
5-32 52-85 MAVERICK Integration (A-6E)  
5-33 8-86 HARM (A-6E TRAM)  
5-35 9-86 FLAP/SLAT System Improvement (A-6E, EA-6A)  
5-37 12-86 Digital Fuel Quantity (A-6E, KA-6D)  
5-39 33-86 Survivability and Vulnerability (A-6E)  
5-41 91-86 Standoff Air-to-Ground Weapons (A-6E TRAM)

EA-6 Mod - P-1 Line Item 45

5-43 19-79 ALQ-99 Pods (EA-6B)  
5-45 14-81 ICAP-I Update Program (Signal Data Converter/Digital Display/Inertial Navigation/AN/AYK-14 Computer) (EA-6B ICAP I)  
5-47 53-82 Radar and Navigation Update (EA-6A)  
5-49 129-85 Fire Protection System (EA-6B)

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5-50	16-81	TF-41 Engine Hot Section Extended Life Program (HELP) (A-7E)
5-53	141-84	AN/ALQ-162 Countermeasures Set Provisions (A-7E)
5-55	130-85	Aircraft SLEP Rewire (A-7E)
AV-8 Mod - P-1 Line Item 47		
5-57	88-85	Digital Engine Control System (DECS) (AV-8B)
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5-62	40-86	AN/ALQ-162 Countermeasures Set Provisions (F-4S)
RF-4 Mod - P-1 Line Item 49		
5-63	128-84	AN/ALQ-162 Countermeasures Set Provisions (RF-4B)
5-64	143-84	AN/APR-43 Provisions (RF-4B)
F-14 Mod - P-1 Line Item 50		
5-65	15-82	TF-30-P-414A Package (F-14A)
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5-69	97-82	Secure Link-4A (F-14A)
5-71	115-82	Structural Fatigue Modification (F-14A)
5-73	152-83	Structural Improvements (F-14A)
5-75	9-84	Increased Wall Thickness of Main Landing Gear (F-14A)
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5-79	42-86	MXU-611 Jettison Release Mechanism (F-14A)
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5-93	42-83	Engine Air Particle Separators (CH-46E)
5-95	45-85	Improvements to Engine Condition Control System (CH/UH/H-46)
5-96	132-85	Navigation and Night/IMC SAR Capability (CH/UH/HH-46)
5-98	47-86	Emergency Flotation System (CH/UH/HH-46)
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5-102	46-80	LTN-211 OMEGA/VLF Navigation Set (CH-53E, CH-53D, CH-53A, RH-53D)
5-104	67-82	Night Vision Goggles (CH-53A/D, RH-53D, CH-53E, MH-53E)
5-106	43-83	Crashworthy Armored Pilot Seats (CH-53A, CH-53D, RH-53D)
5-108	65-84	Crashworthy Fuel System (CH-53A, CH-53D, RH-53D)
5-110	133-85	Aircraft Survivability Improvement (CH-53A, CH-53D, RH-53D, CH-53E, MH-53E)
5-112	2-86	AN/ARC-182(V) VHF-UHF, AM/FM Transceiver (CH-53A, CH-53D, RH-53D, CH-53E)
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5-122	156-84	Automatic Hover Coupler (UH-1N)
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5-128	72-84	DC Fuel Quantity System and 100-Gallon Auxiliary Tanks (SH-2F, HH-2D, NHH-2D)
5-130	60-85	ASN-123 Tactical Navigation Set Improvement (SH-2F, HH-2D)
5-132	127-85	Torpedo Depth Control (SH-2F)
5-134	20-86	Composite Main Rotor Blade (SH-2F, HH-2D, NHH-2D)
5-135	21-86	Main Gear Box Improvements (SH-2F, HH-2D, NHH-2D)

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5-142	55-85	VHF Comm/NAV Equipment (SH-3H, SH-3D, UH-3A, SH-3G, HH-3A, VH-3A)
5-143	16-86	AN/ASN-123 Tactical Navigation Set Modifications (SH-3H)
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5-187	64-83	TRAC-A (Weapon Improvement) (E-2C)
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5-191	27-86	Radar Update Group I (E-2C)
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5-214	110-79	AN/ALQ-126B (A-4M, A-6E, A-7E, F-4S, RF-4B, F/A-18, F-14, EA-6B, AV-8B/C)
5-216	113-85	AN/APR-43 (A-4M, RF-4, A-7E, F-4S)
5-217	114-85	AN/ALR-67 Radar Receiving Set, Countermeasures (F/A-18, A-6E, F-14)
5-219	115-85	AN/ALQ-162 Countermeasures Set (A-4M, RF-4B, F-4S, A-7E, AV-8)
5-220	36-86	AN/APR-39A(V)1 (AH-1J/T, UH-1N, CH-53A/D, RH-53D, CH-46E, MH-53E, OV-10A/D, HH-3A)
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5-225	87-86	UHF Relay Pod (S-3, A-6, A-7)



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Communications and Intercommunication System Update (OSIP 86-25)

Models of Aircraft Affected: EA-3B, TA-3B, ERA-3B, KA-3R, NRA-3B, VA-3B, RA-3B, NA-3B, A-3B

Description/Justification:

In recent years re-analysis of mission requirements, non-availability of a replacement weapon system for the A-3 aircraft and sufficient remaining airframe life has led to the decision to extend the planned service life of the A-3 aircraft. As the A-3 aircraft were originally scheduled for retirement in Fiscal Year 1985, many of the Avionics Systems need replacement or upgrading. Use of these older systems in A-3 aircraft degrade the support posture and operational readiness.

Out-of-production end assemblies and components, unique training requirements, maintenance capability, and ground support equipment all contribute to poor system reliability and maintainability, reduced mission capability and operational effectiveness of the aircraft. Recently, Tempest testing of an A-3 aircraft indicated a serious problem exists in the COM/NAV installation in the area of secure communications. Replacement of these systems would allow removal of operational restrictions (workaround) placed on these aircraft.

Portions of the existing communications and ICS systems presently installed in most A-3 aircraft exhibit low reliability and require excessive maintenance manhours to keep operable. The system is aging and uses vacuum tubes which reduce the mean time between failure (MTBF) of the system and adds to an excessive heating problem in some models.

Replacing the intercommunications systems throughout the aircraft and installing a new communications suite comprising components such as the ARC-190 'IF' radio, ARC-175/ARN-126 VHF suite and replacement of the ARC-51 UHF communication radios in the A-3 aircraft still using that system with the ARC-159 will provide improved reliability through the projected life of the aircraft.

Development Status: This modification will use equipment that is currently in the Navy inventory. The proposed ICS System is basically an Air Force developed system and qualification testing was completed in the fourth quarter FY 1983. Nonrecurring engineering is required to adapt the equipment to the A-3 aircraft. Equipment approval for full production (AFP) has been granted, but Tempest testing is required to verify the installation. Current plans include kit design, testing, manufacturing, and installation to be accomplished by a contractor.

OSIP 86-85

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$3,685		\$2,710		\$442	46*	\$6,395
O&MN Install.				\$490		\$50		932
O&MN Training		\$78		\$60				188
APN-6 Spares		\$150		\$205				<u>355</u>
GRAND TOTAL								\$7,870

\*Total quantity of aircraft to receive mods.

Installation Data: Due to workload priorities at the Naval Air Rework Facility (NAVAIREWORKFAC), A-3 airframe change kits are procured from a commercial contractor. The contractor will provide drive-in/field team modifications to expedite the modification program and reduce the impact on operational availability of these limited quantity, special mission aircraft.

NOTE: Because of differences between models of the same aircraft, not all portions of the modification are applicable to every bureau number.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-162 Countermeasures Set Provisions (OSIP 4-83)

Models of Aircraft Affected: A-4M

Description/Justification:

This OSIP provides for the AN/ALQ-162 installation provisions. The AN/ALQ-162 GFE in FY 1985 and subsequent is contained in the AN/ALQ-162 OSIP 115-85.

The AN/ALQ-162 provides complementary CW jamming to the operational AN/ALQ-126B pulse jammer installed in tactical aircraft. The AN/ALQ-162 will accept threat handoff data from the AN/APR-43 Radar Warning Receiver and utilize a common transmit/receive antenna integral to the AN/APR-43 antenna assembly. The AN/ALQ-162 also provides a stand alone capability allowing for defensive electronic countermeasures in event of AN/APR-43 failure. The AN/ALQ-162 design is fully reprogrammable to handle future threat parameter changes. The AN/ALQ-162 provides a significant increase in survivability for Navy tactical aircraft against radar directed air defense weapons.

Development Status: Northrop Defense Systems Divisions is under contract and provided engineering development models in the second quarter of FY 1981 for test and evaluation. TEMP No. 593 supports Navy test and evaluation. The RDT and TECHEVAL are complete. Approval for limited production (ALP) is expected in the second quarter of FY 1985. RDT&E,N Program Element Number 64224N applies.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$266	4	\$4,579	9	\$201	2	\$54	35	\$833	20	\$521
AMN Install.					(5)	\$38	(5)	\$62	(2)	\$14	(12)	\$100
OSMNR Install.							(4)	\$33			(15)	\$125
APN-6 Spares						\$280		\$5				

OSIP 4-83

Project Financial Plan (Cont'd):

	FY 1989		TOTAL	
	Qty	Cost	Qty	Cost
APN-5				
O&MN Install.	(20)	\$166	71	\$6,454
O&MNR Install.	(8)	\$66		380
APN-6 Spares				224
				<u>285</u>
GRAND TOTAL				\$7,343

Installation Data: Installation of the airframe change kit will be accomplished during Standard Depot Level Maintenance (SDLM) and field Mod teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ARN-118 TACAN (OSIP 6-83)

Models of Aircraft Affected: TA-4F/TA-4J

Description/Justification:

The AN/ARN-118 TACAN set is the airborne unit of the tactical navigation system (TACAN). The set was developed as a low cost, high reliability replacement for the older tube type equipments. It is a direct replacement for the current AN/ARN-52 TACAN and uses the same mounting provisions and aircraft wiring. Specified/demonstrated reliability is 1200 hours vice 150 hours for the AN/ARN-52.

Development Status: The system is already installed in the A-4M aircraft. Approval for Full Production has been received.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	45	\$1,069	84	\$2,025	83	\$2,229	89	\$2,372		
O&MN Install.					(65)	\$38	(46)	\$25	(95)	\$53
O&MNR Install.			(7)	\$4	(7)	\$4	(11)	\$6	(12)	\$7
APN-6 Spares								-0-		

OSIP 6-83

Project Financial Plan (Cont'd):

	<u>FY 1988</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(63)	301 \$7,695
O&MNR Install.	(2)	150 \$34
APN-6 Spares		18 \$1
		-0-
GRAND TOTAL		\$7,863

Installation will be accomplished by the Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Constant Frequency Generator Improvement Program (OSIF 129-33)

Models of Aircraft Affected: T4-4F/J

Description/Justification:

The Constant Frequency Drive (CSD) presently installed in TA-4F/J aircraft is a perennial high maintenance item. The units are not in production, no spares are difficult to obtain with long lead times. Many of the CSD housings are wearing out and will become unusable within a few years. The housings are not procurable as a spares item. Therefore the scrap rate will increase, and without a supply of new units a shortage of units in the fleet will develop. The aircraft is not mission capable without a CSD unit.

Development Status: Naval Air Test Center (NATC) Patuxent River is testing a new Constant Frequency Generator which is similar to a unit tested in a New Zealand Air Force A-4K aircraft. Similar qualification testing is planned for FY 1985 in a Chief of Naval Air Training TA-4J aircraft. Approval for Full Production (AFP) is not required. The unit installed in the A-4K aircraft flew 242.3 maintenance free flight hours prior to 30 September 1982.

Project Financial Plan:

	FY 1983		FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$650	64	\$4,812	71	\$5,662	76	\$6,253	65	\$5,607	280	\$22,984
O&MN Install. "O" or "I" Level						-0-						-0-
C&MN Verification				\$3								3
APN-6 Stores				\$1,056		\$913		\$1,188				3 157
GRAND TOTAL												\$26,144

Installation Data: Installation will be accomplished at Organizational or Intermediate levels.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: AFN - Activity 5

Modification Title and No.: TA-4J AN/ARC-159(V)5; UHF Transceiver (OSIP 64-85)

Models of Aircraft Affected: TA-4J

Description/Justification:

The ARC-159(V)5 transceiver will replace the presently installed AN/ARC-51A UHF equipment which is a major cause of mission aborts, below standard readiness, high maintenance (51 Mean Flight Hours Between Failure (MFHBF) for the ARC-51A compared to 166 MFHBF for the ARC-159(V)5) and high support expenditures. The ARC-51A is a 1950 design with vacuum tubes, while the ARC-159(V)5 is all solid state. Utilization of the ARC-159(V)5 will provide improvement in reliability, thus significantly reducing support costs and saving manpower (4.7 man years saved). In addition, this effort will improve mission effectiveness and greatly reduce safety of flight conditions.

Development Status: The AN/ARC-159(V)5 system has been installed in OA-4M (TACA), TA-4F and Blue Angel aircraft with AF-621 and AVC-1757 Amend 1 incorporated. TEMPEST testing was completed on TA-4F and OA-4M aircraft. No approval for full production (AFP) is required.

Project Financial Plan:

	FY 1985	FY 1986	FY 1987	FY 1988	TOTAL
	Qty	Cost	Qty	Cost	Qty
APN-5	02	\$2,270	77	\$2,440	267
O&MN Install. "O" & "I" Levels				\$1,469	
APN-6 Spares					
GRAND TOTAL					\$8,647

Installation Data: AFC and AVC kits will be installed by "O" and "I" personnel respectively.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APN-194 Radar Altimeter System (FY 55-85)

Models of Aircraft Affected: TA-4F/J

Description/Justification:

The APN-194 Radar Altimeter System will replace the presently installed AN/APN-141 equipment which is a major cause of high maintenance and below standard readiness (51.2 Mean Flight Hours Between Failure (MFHBF) for APN-141 compared to 349.6 MFHBF for the APN-194). Maintenance support expenditures are also high due to old test equipment failures. Utilization of the AN/APN-194 system will provide improvement in reliability and maintainability, thus significantly reducing support costs and saving manpower (7.1 man years saved).

Development Status: The AN/APN-194 has been installed in A-4F/M and OA-4M aircraft with AFC-555 incorporated. Further development and approval for full production (AFP) are not required. AFC-555 will be amended to include TA-4J aircraft.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	64	\$1,540	106	\$2,604	91	\$2,348	23	\$623		
O&MN Install.			(23)	\$22	(96)	\$92	(74)	\$71	(64)	\$62
O&MNR Install.			(6)	\$6	(12)	\$12	(3)	\$3	(2)	\$2
O&MN Training				\$19						
APN-6 Spares		\$9		\$16						

OSIP 65-85

Project Financial Plan (Cont'd):

	<u>FY 1990</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.		284 \$7,124
O&MNR Install.	(4) \$4	247
O&MN Training		27
APN-6 Spares		19
		<u>25</u>
GRAND TOTAL		\$7,442

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) concurrently with Standard Depot Level Maintenance (SDLM).

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: AN/APR-43 Provisions (OSIP 67-85)

Models of Aircraft Affected: A-4M

Description/Justification:

This OSIP provides for the AN/APR-43 installation provisions. The AN/APR-43 GFE in FY 1985 and subsequent is contained in the AN/APR-43 OSIP 113-85.

The AN/APR-43 system is a radar warning receiver and will operate in conjunction with the AN/ALR-45F Radar Warning Receiver. It provides required combat mission essential countermeasures warning and direction finding beyond that provided by the existing AN/ALR-45(V) and AN/ALR-50(V) installations.

Development Status: TECHVAL and OPEVAL are completed in the A-7E. Approval for limited production (ALP) was granted in October 1983. FOT&E is ongoing and is planned for completion in mid FY 1985. RDT&E, N Program Element Number is 63206N (WO 638-TW).

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	47	\$798	30	\$469	33	\$263			110			
O&MN Install.			(8)	\$203	(42)	\$1,066	(12)	\$305				\$1,530
O&MNR Install.			(2)	\$51	(6)	\$152	(14)	\$355	(26)	\$660		1,574
O&MN Training				\$20								1,218
APN-6 Spares		\$79		\$69		\$26						20
												174
GRAND TOTAL												\$4,516

Installation Data: Installation will be accomplished by Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM) and by Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Target Recognition and Attack Multisensor (TRAM) (OSIP 1-76)

Models Aircraft Affected: A-6E

Description/Justification:

This program will provide the A-6E with improved capability for location and surveillance of opposing naval forces, and the countering of operations during periods of darkness. In cold war, reconnaissance requires maximum night identification and surveillance capability. In limited war, accurate 24-hour strike capability against enemy sea and sea support targets will be the highest priority mission of the A-6E. This system, developed under SOR W11-93, includes a passive imaging infrared sensor for target classification and identification of a laser target designator/ranger boresighted with the infrared sensor for delivery of laser guided weapons, and a laser search set to locate targets illuminated by external laser designators. All equipment is collocated in a 20-inch diameter turret which is space stabilized and cued to suspected targets by the search and acquisition radar. The TRAM components do not replace or degrade existing A-6E equipments and weigh less than 500 pounds.

In order to achieve an effective force level of TRAM capable aircraft and ensure commonality of configuration and support, the TRAM system is being installed in both A-6E production aircraft and A-6E aircraft being modified to production configuration under the A-6 ASN-92 (CAINS) and UNI Combined (Configuration Update) OSIP 9-77. A6E aircraft delivered since CY 1976 have TRAM wiring and cockpit provisions for CAINS and Communication, Navigation, Identification (CNI) equipment.

The TRAM is currently being procured by the Naval Air Systems Command on a multi-year contract through the completion of procurement (FY 1987).

Development Status: The development program was funded by RDT&E. Approval for service use (ASU) was granted in March 1980 and full production release was issued in April 1980.

OSIP 1-76

Project Financial Plan:

	FY 1976		FY 1977		FY 1978		FY 1979		FY 1980	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 Proc.	3	\$9,671			18	\$40,542	35	\$74,804		
APN-5 Install.				\$11,229		\$14,055		\$74,804		
Total APN-5		\$9,671		\$11,229		\$14,353		\$25,387		
APN-6 Spares										\$13,926
	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 Proc.		\$388	15	\$28,312	20	\$38,730	14	\$28,482	36	\$64,706
APN-5 Install.										
Total APN-5		\$388		\$28,312		\$38,730		\$28,482		\$65,162
O&MN Install.				\$268		\$287		\$326		\$363
APN-6 Spares		\$4,500								
	FY 1987		FY 1988		TOTAL					
	Qty	Cost	Qty	Cost	Qty	Cost				
APN-5 Proc.	26	\$58,394			204	\$424,706				
APN-5 Install.						513				
Total APN-5		\$58,394				\$425,219				
O&MN Install.		\$402		\$424		2,453				
APN-6 Spares						58,166				
GRAND TOTAL						\$485,838				

\* Quantity represents DRS's.

Installation Data: Installation of TRAM is being accomplished by the contractor under an integrated A-6E configuration update program which includes the retrofit of TRAM/CAINS/CNI equipments in 163 of the original versions of the A-6E. In addition, TRAM will be backfitted into 101 A-6E aircraft already delivered with CAINS/CNI equipments.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification title and No.: A-6 ASN-92 (CAINS) and CNI Combined (Configuration Update) (OSIP 9-77)

Models of Aircraft Affected: A-6E

Description/Justification:

The AN/ASN-92(V) Inertial Measurement Unit (IMU), Mount, and Power Supply Unit (PSU) will replace the present AN/ASN-31 Inertial Navigation System which has been phased out of production. The AN/ASN-92 is being installed in production and retrofit A-6E aircraft. The ASN-92 has demonstrated its capability in meeting performance parameters including higher reliability than presently attainable with the ASN-31 system. The ASN-92 IMU, Mount, and PSU are common equipment on the F-14A, S-3A, E-2C and the RF-4B. This modification will significantly reduce the number of spares and unique test equipment. The weight and volume of the ASN-92 equipment is 55.4 pounds and 1.0 cubic feet, respectively. The A/C Converter modifies the existing converter to adapt the ASN-92 signals to the A-6E avionics with no increase in weight or space. BNCB/BIT is a modification to the cockpit controls of the aircraft radar to provide improved radar operator efficiency with no increase in space or weight. The MU-602/ASQ-133A Auxiliary Core Memory Unit (ACMU) provides an additional 8,000 words of core storage to meet the CAINS software requirement. The ACMU is interchangeable functionally and electrically with the existing computer memory. The memory weighs 30 pounds and is .709 cubic feet.

The reliability and maintainability of the A-6E is being enhanced by the replacement of the present ASQ-57 CNI package (a 1950 design) with modern, flexible, more reliable and individually mounted government furnished CNI equipment (i.e., two AN/ARC-159 UHF radios, AN/ARN-84 TACAN set, AN/APX-72 transponder). The ASQ-57 package provides for only one UHF radio resulting in loss of communication upon failure. This replacement will provide greater reliability/maintainability and at the same time will significantly decrease the maintenance manhours and associated support. There will be a 57 percent reduction in weight.

Development Status: All GPF hardware has been developed and is being installed in A-6E production aircraft.

Project Financial Plan:

• Prototypne

Installation Data: Installation is being accomplished by the contractor under an integrated A-6E configuration update program which includes the concurrent retrofit of CAINS, CNI and TRAM equipments in 163 of the original versions of the A-6E. Fifty-one of these aircraft are being rewinged coincidental with retrofit. All retrofit aircraft also receive SDLM.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/IP-722F Vertical Display Indicator (VDI) (OSIP 1-78)

Models of Aircraft Affected: A-6E/KA-6D

Description/Justification:

The Vertical Display Indicator (VDI) is a dynamic contact analog TV display, composed of easily identified ground and sky textures integrated with flight path presentations and other visual flight cues. The cues assist the pilot in flying the aircraft during takeoff, navigation, attack and landing. Through the use of this display the pilot is able to fly his aircraft under all conditions as though he were in actual contact flight.

The present VDI, the IP-722/AVA-1, was designed in the mid 1950s using the latest technology of that era. The circuit technology, reliability and maintainability are archaic by present day standards. The discrete components (resistors, capacitors, transistors, etc.) that make up this display are no longer available. Substitute components are not directly replaceable requiring extensive redesign when they must be substituted. Nonavailability of parts is escalating the cost of the unit while decreasing the already poor reliability and maintainability.

The proposed system is a direct replacement for all A-6 aircraft. Improved technology will increase the reliability from 50 hours to 400 hours and decrease the mean-time-to-repair from 5 hours to 1 hour. It will also provide increased brightness, accuracy and stability. The redesigned unit includes the capability to put FLIR video on the VDI and provides additional symbology for automatic carrier landing system (ACLS). Airframe wiring provisions for FLIR video will be installed during the TRM retrofit program. Weight of the new unit will be 45 pounds vice 56 pounds of the current indicator. This equipment can be installed at organizational level.

Development Status: This equipment was developed using FY-75/76 AERNIP funding. Four prototype indicators were built for test and evaluation. Development testing was completed in May 1978. Approval for service use (ASU) was issued in February 1979.



Project Financial Plan:

	FY 1978		FY 1981		FY 1982		FY 1983		FY 1984	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	85	\$4,200	21	\$2,048	12	\$878	91	\$6,320	108	\$10,277
APN-6 Spares		\$267						\$11		
			<u>TOTAL</u>							
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>						
APN-5	84	\$8,865	399	\$32,588						
O&MN Install. ("0" Level)		-0-		-0-						
APN-6 Spares		-0-		278						
GRAND TOTAL				\$32,866						

Installation Data: This indicator is a direct replacement and will be installed at the organizational level. The wiring provisions for FLIR video will be included in the TRAM retrofit program.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: A-6E Weapon Control System Improvement (OSIP 102-80)

Models of Aircraft Affected: A-6E

Description/Justification:

The A-6 all-weather attack aircraft was introduced in the Navy in 1963. Numerous modifications have been incorporated in the aircraft since its introduction primarily to improve its reliability, safety, and operational capability. The latest model of the aircraft, the A-6E, is being purchased as a new production article as well as a Conversion in Lieu of Procurement (CILOP) program which converted the older A-6A to the A-6E. The CILOP program completed in FY 1979.

Throughout the years, as new ordnance/weapons have been introduced into the inventory, the A-6 has been adapted to ensure compatibility so that the aircraft will remain current in its weapon delivery capability. In most instances, the adaptations to the aircraft have consisted of the addition of avionics packages/wiring/software dedicated to the specific weapons. As a result, there is a proliferation of weapon control system configurations in Fleet aircraft which are difficult to maintain. Further adaptations to the weapon control system, utilizing the approach of adding major processing packages/wiring dedicated to a specific weapon can no longer be tolerated.

The 4 Pi computer in the A-6E aircraft series is limited in memory capacity. Modifying the computer with a double density memory capability will provide the additional capacity required for current weapons, as well as those postulated in the future, thus eliminating the need for dedicated processing packages for each weapon. The armament wiring complexity of the aircraft can also be greatly simplified, leading to a universal wiring concept of implementation. The overall result will lead to higher operational reliability in the fleet and a reduction in ordnance maintenance manhours, as well as provide all A-6 aircraft with full capability to carry and deliver current weapons such as SIDEWINDER, SHRIKE, etc. Ample growth is inherently available for such follow-on weapons as LASER/IR MAVERICK, HARPOON, HARM and the follow-on stand off weapon.

With this as the basis, the program consists of the installation of improved armament wiring in all aircraft which will be accomplished during the configuration update of the A-6E TRAM (described in OSIP 1-70) to minimize installation costs. Production A-6E TRAM aircraft received the new wiring installation commencing with the FY 1979 procurement. A-6E TRAM configured aircraft (101) delivered prior to the initiation of this program will have the wiring provisions installed during rewiring (SLEP) in FY 1983 through FY 1986. In addition, this program will install modified computers (double density memory) in all aircraft.

OSIP 102-80

Development Status: The improved armament wiring completed engineering and is being installed in FY 1979 new production aircraft. The double density memory computer modification has completed all testing and commenced installation in E-121 (FY 1979).

Project Financial Plan:

	FY 1980		FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	35	\$1,724	47	\$1,714	20	\$1,629	13	\$5,963	14	\$4,909	32	\$8,028
O&MN Install.		\$1,092	(17)	\$1,092	(35)	\$2,451	(32)	\$2,446	(15)	\$1,200	(22)	\$1,845
APN-6 Spares		\$1,202		\$410		\$640						
	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL			
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	60	\$11,880	38	\$8,467					259	\$44,314		
O&MN Install.	(20)	\$1,752	(32)	\$2,804	(60)	\$5,256	(26)	\$2,278		21,124		
APN-6 Spares		-0-								2,252		
GRAND TOTAL										\$67,690		

Installation Data: The wiring installation commenced in FY 1981 at the onset of the integrated configuration update of A-6E aircraft to the A-6E TRAM. A-6E TRAM aircraft delivered prior to initiation of this modification will receive installation during scheduled Rewing (SLEP) conducted by the contractor in FY 1985 through FY 1990.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activit, 5

Modification Title and No.: KA-6D Reliability, Maintainability (R&M) and Service Life Extension Program (SLEP) (OSIP 5-82)

Models of Aircraft Affected: KA-6D

Description/Justification:

The KA-6D is the only carrier aircraft dedicated to the mission of inflight refueling. With the introduction of new fighter and attack aircraft to the fleet there will be an increase in the requirement for inflight refueling. In order to meet fleet tanker needs through the mid-1990's, the existing tanker assets must be upgraded in order to maintain readiness requirements. The existing KA-6D tanker force consists of older A-6 aircraft which were converted to the KA-6D configuration. This program will bring the configuration of the older tankers up to the latest configuration as well as incorporate improvements to extend the service life, and increase reliability and maintainability. The SLEP improvements will consist of the following:

- a. Install new wings/wing material as required which includes new FS227 and FS285 bulkheads (made with 7050-T73 material which is more resistant to stress corrosion) and a new drag linkbrace which will approximately double the service life of the aircraft.
- b. Increase the arresting hook strength to the same strength as the A-6E.
- c. Modify the stabilizer shift mechanism and provide electrical switching to prevent failure and inadvertent actuation of spin assist in flight.
- d. Improve flap/slat system by: (1) providing improved sealing of flap switch box, slat gear box and slat cam, (2) providing hermetically sealed switches, (3) replacing flap box cam and switches with more wear-resistant material, (4) providing higher strength slat actuator attach lugs, and (5) eliminating the 40 degree flap position.
- e. Improve the integrity of the fuel system.
- f. Complete revire.

Development Status: All development is complete.

Project Financial Plan:

	FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5					49	\$ 75,181
O&MN Install.	(12)	\$31,277	(5)	\$17,478		131,023
APN-6 Spares						386
GRAND TOTAL						\$206,590

Installation Data: Installation will be accomplished at the contractor's plant.



**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: Radar Data Converter Improvements (OSIP 9-83)

Models of Aircraft Affected: A-6E

Description/Justification:

The Radar Data Converter (RDC) converts radar elevation/range data into a TV terrain clearance presentation. This allows the A-6 to operate at low altitude and avoid terrain during all weather conditions. The existing RDC was designed in the late 1950's using analog technology of that era. Consequently the old design is no longer producible and replacement components are unavailable. The new RDC utilizes modern digital technology to provide a factor of 10 increase in reliability (1,200 hrs vice 120) and built in test (BIT) for improved maintainability (approximately 12,000 manhours savings per year). The new unit provides increased safety with 256 azimuth bins vice 20 allowing small vertical objects such as radio towers to be displayed. Flight safety will also be enhanced with implementation of continuous BIT which provides the crew with an immediate warning of radar failure.

Development Status: AERMIP development contract was awarded to Kaiser Electronics in April 1980. Qualification testing completed in late 1983. Flight testing completed in December 1982.

Project Financial Plan:

	FY 1983		FY 1984		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	10	\$2,648	108	\$5,382	108	\$6,775	95	\$6,264	321	\$20,459
O&MN Install. "O" Level						-0-		-0-		-0-
APN-6 Spares		\$96		\$1,583		-0-				1,679
<b>GRAND TOTAL</b>										<b>\$22,148</b>

Installation Data: Installation will be accomplished by organizational level personnel.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALR-67 Radar Receiving Set, Countermeasures (OSIP 51-34)

Models of Aircraft Affected: A-6E

Description/Justification:

This OSIP provides for the AN/ALR-67 installation provisions. The AN/ALR-67 GFE in FY 1985 and subsequent is contained in the AN/ALR-67 OSIP 114-85. The AN/ALR-67 Radar Receiving Set, Countermeasures Warning and Control System is the radar and missile warning system in advanced tactical aircraft (F/A-18, A-6E, & F-14). The AN/ALR-67 provides detection and direction finding (DF) over the entire RF spectrum of target tracking and missile control systems. It provides full hemispherical coverage in all platform installations. The AN/ALR-67 is a reprogrammable system incorporating a high intensity alpha-numeric azimuth display. The system is fully integrated, via the MIL-STD-1553 data buss, with other on-board EW equipments. The AN/ALR-67 provides significant improvements/enhancements in DF coverage, threat coverage and reliability/maintainability over equipments currently in use.

Development Status: Engineering development models have undergone reliability development test, environmental qualification test and TECHEVAL. Operational effectiveness testing in the A-6E is complete. OPEVAL will be conducted in the F/A-18 in the second quarter of FY 1985. Follow-on tests will be carried out in the A-6E and AV-8B in FY 1985. Testing in the F-14 is anticipated in FY 1986. Approval for Limited Production (ALP) for 163 units was granted in the second quarter of FY 1984. Approval for Full Production (AFP) will be requested upon completion of the majority of follow on testing.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	10	\$10,775	32	\$847	60	\$2,189	60	\$2,055	60	\$1,845	60	\$1,934
O&MN Install.					(14)	\$1,025	(32)	\$1,992	(60)	\$3,728	(60)	\$3,728
APN-6 Spares		\$1,872		\$85		\$167						



OSIP 51-84

Project Financial Plan (Cont'd):

	<u>FY 1990</u>		<u>FY 1991</u>		<u>FY 1992</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5								
O&MN Install.	46	\$1,555					328	\$21,200
APN-6 Spares	(60)	\$3,728	(60)	\$3,728	(42)	\$2,623		20,552
								<u>2,124</u>
GRAND TOTAL								\$43,876

Installation Data: Installation of kits will be during Standard Depot Level Maintenance (SDLM) at Naval Air Rework Facility (NARF) and by the contractor.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: A-6E MAVERICK Integration (OSIP 52-85)

Models of Aircraft Affected: A-6E

Description/Justification:

Integration of the MAVERICK missile series in the A-6E aircraft will provide the fleet with an improved close air support and discrete target capability, with improved standoff and launch-and-leave capability over conventional free-fall weapons. Addition of MAVERICK capability requires modification of the twenty-one (21) Avionics Interface Sets (AIS) already procured under OSIP 8-83 in FY 1983 and FY 1984. This requires addition of new/modified SRAs to the existing integrated missile panel (IMP)/avionics interface unit (AIU). In addition, LAU-117 launchers and weapons umbilical cables are required to carry/employ the MAVERICK missile. This program provides for retrofit of existing AISs and for 20 launchers/unbilical cables per operating squadron.

Development Status: RDT&E,N funding has been budgeted under Program Element No. 63313. Evaluation of Laser MAVERICK integration is planned to start in FY 1985, with OPEVAL completed in FY 1986. OPEVAL for LASER MAVERICK with the A-4M aircraft was completed in July 1982. OPEVAL for IIR MAVERICK with A-7E aircraft was completed. Approval for full production (AFP) for the A-6E will be extended by similarity from these applications following successful A-6E integration testing.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	15	\$2,066						
OSMN Install. 'O' & 'I' Levels				\$7,758		\$4,269	15	\$14,093
APN-6 Spares		\$155		-0-		\$379		-0-
				\$1,128				1,662
GRAND TOTAL								\$15,755

Installation Data: AFC kits consist of SRAs, which will be incorporated at organizational and intermediate levels. Aircraft wiring will be incorporated with ALR-67 under OSIP 51-84.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: HAEM (OSIP 8-86)

Models of Aircraft Affected: A-6E TRAM

Description/Justification:

Integration of the HARM Missile in the A-6 TRAM aircraft will provide the fleet an improved anti-radiation missile for the A-6 with additional stand-off range and self-protection capability. Addition of HARM in the A-6E TRAM aircraft requires interface with Weapon Control System Improvement (WCSI) configured aircraft equipped with the CP-38 mission computers. This modification will provide the necessary nonrecurring effort for retrofit of HARM capability into the A-6E TRAM, procure modification kits and HARM peculiar avionics for retrofit, provide for the procurement of Peculiar Ground Support Equipment (PGSE) and provide the procurement of LAU-118 launchers for retrofit aircraft. The HARM avionics designated AWG-( ) consists of the Command Launcher Computer (CLC) and the Control Indicator (Ci). The HARM avionics will also interface with the ALR-67 which is being provided for A-6E TRAM installation under a separate OSIP program.

Development Status: RDT&E,N funding is provided under Program Element Numbers 64360N and 24134N. System Development testing is to be completed in late FY 1985. Approval for full production on the HARM Weapon based on testing with A-7 type aircraft was reviewed in March 1983.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	32	\$22,554	60	\$22,636	60	\$20,251	60	\$20,007	60	\$20,969
O&M Install.					(32)	\$523	(60)	\$980	(60)	\$980
O&M Factory Training						\$86				
APN-6 Spares		\$1,751		\$4,306						

OSIP 8-86

Project Financial Plan (Cont'd):

	FY 1991		FY 1992		FY 1993		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	60	\$21,978			332	\$128,395		
O&MN Install.	(60)	\$980	(50)	\$980	(50)	\$980		5,423
O&MN Factory Training								96
APN-6 Spares								6,057
GRAND TOTAL								\$139,961

Installation Date: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) at the Naval Rework Facility (NARF) and at the contractor's plant.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: FLAP/SLAT System Improvement (OSIP 9-86)

Models of Aircraft Affected: A-6E, EA-6A

Description/Justification:

Various problems have been experienced in the flap and slat systems: (1) water intrusion and corrosion of components in the flap switch box and wear of the switch cam, (2) water intrusion and wear of components in the slat gear box, (3) structural failure of the slat actuator attach lugs, and (4) water ingress and freezing resulting in failure of the slat cam. This change will correct these deficiencies by: (1) providing improved sealing of the flap switch box, slat gear box, and slat can; (2) providing hermetically sealed switches in the flap switch box and slat box and slat gear box; (3) replacing cam and switch wear surfaces with more wear-resistant material; and (4) providing slat actuator lugs of higher strength which are fabricated to revised tolerances to prevent induced bending loads due to clamp-up. In addition, the slat gear box is designed to be removable for ease of maintenance and the front wing cam revision will provide a thicker web to permit installation/removal of the slat can from the front of the beam.

Development Status: Development is complete. This change was incorporated in FY 1982 production aircraft.

OSIP 9-96

Protect Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	100	\$6,889	100	\$4,735	78	\$3,873	78	\$4,060			356	\$19,557
O&MN Install.			(48)	\$636	(119)	\$1,653	(138)	\$1,762	(41)	\$505		4,556
O&MNR Install.			(2)	\$33	(2)	\$33	(3)	\$49	(3)	\$49		164
O&MN Training		\$40										40
APN-6 Spares		\$631		\$663		\$465		\$487				2,246
GRAND TOTAL												\$26,563

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) at the Naval Air Rework Facilities (NARF's), Norfolk and Alameda, and during the TRAM update program at Grumman.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Digital Fuel Quantity (OSIP 12-86)

Models of Aircraft Affected: A-6E, KA-6D

Description/Justification:

The current fuel quantity system (FQS) uses capacitance probes and low level capacitance signals which are prone to error due to moisture and corrosion-induced resistance and capacitance changes in connectors, splices and sensing lines. System problems cause numerous abort sorties and require over 13,000 maintenance manhours per year for trouble shooting and repair efforts. Throughout FY 1981, FY 1982 and FY 1983, the fuel and fuel quantity system problems continued to rank as number one or two in the list of equipments which cause the A-6E and KA-6D aircraft to be "not mission capable." Additionally, the existing mechanical fuel quantity indicator is unreliable. The proposed system will use digital signals from the fuel probes to the indicator and a solid state indicator with built-in test. The projected advantages of the new FQS are improved reliability, increased accuracy and improved maintainability.

Development Status: A preliminary design has been completed by the Naval Air Rework Facility, Norfolk. A prototype system was fabricated with flight test to be completed by mid FY 1985 and will be incorporated in FY 1985 production.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	00	\$6,574	132	\$8,030	132	\$8,421	57	\$3,812		
OMW Install.					(86)	\$925	(110)	\$1,309	(121)	\$1,398
OMW Training		\$43								
APN-6 Snares		\$882		\$1,082		\$1,135				

CSIP 12-86

Project Financial Plan (Cont'd):

	<u>FY 1991</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(94) \$1,179	411 \$26,837
O&MN Training		4,811
APN-6 Spares		43
		<u>3,099</u>
GRAND TOTAL		\$34,790

Installation Data: The Digital Fuel Quantity System will be installed during Standard Depot Level Maintenance (SDLM) at the depot and during the drive-in modification programs at Grumman and by Nav. field Mod teams.



[illegible]

OSIP 33-86

Project Financial Plan (Cont'd):

	FY 1991		FY 1992		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5						
O&MN Install.	(106)	\$1,364	(106)	\$1,364	335	\$54,808
APN-6 Spares						4,294
						2,305
GRAND TOTAL						\$61,407

Installation Data: Installation will be accomplished at the Contractor's Plant and by a Naval Air Rework Facility (NARF)  
Field Mod Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Stand-off Air-to-Ground Weapons (OSIP 91-86)

Models of Aircraft Affected: A-6E TRAM

Description/Justification:

The command guidance schemes for follow-on standoff air-to-surface weapons projected for use with the A-6E aircraft require data-link commands from the aircraft to the missile in flight, and for receipt of feedback signals from the missile to the aircraft. This feedback includes video signals from the weapon seeker for display on existing A-6E TRAM displays to provide target selection and aimpoint refinement through operator control inputs. The A-6 will utilize an enhanced WALLEYE II data link pod mounted on the centerline bomb station for data link and video monitoring of follow-on standoff air-to-surface weapons. This OSIP provides the enhanced WALLEYE II pods for use on the A-6E.

Development Status: Development of the WalleYE II data link pod is complete. MUX bus capability to the centerline pylon for digital data link pod capability and video cabling to the centerline will be provided by OSIP 8-83, Weapons Integration.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		FY 1991	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
O&MN Install. "O" & "I" Level	1*	\$4,052	25	\$9,675	50	\$14,697	30	\$15,404	30	\$9,687	50	\$16,822
APN-6 Spares				-0-								
				\$209								

OSIP 91-86

Project Financial Plan (Cont'd):

	<u>FY 1992</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5	50 \$17,578	256 \$87,915
O&MN Install. "O" & "I" Level		-0-
APN-6 Spares		<u>209</u>
GRAND TOTAL		\$88,124

#Prototype.

Installation Data: Installation will be accomplished at intermediate and organizational level.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ALQ-99 Pods (OSIP 19-79)

Models of Aircraft Affected: EA-6B

Description/Justification:

The refurbishment of existing pods will increase operational capability, system readiness, and enhance flight safety. During 1976/1977, 60 unsatisfactory reports (UR's) were generated due to ALQ-99 pod anomalies. These improvements will reverse this trend and will lessen significantly the damage to pod components which occurs due to circuitry malfunction. Typically arcing damage of this type requires more than \$300,000 for repair of each pod at the depot. Timely address of ALQ-99 anomalies will impact life cycle cost and operational readiness very favorably. Major improvements will include the universal exciter which will improve exciter capability, the transmitter reliability improvement program which updates all high band transmitters to the latest configuration, and the low band improvement program which updates bands 1/2 to the latest configuration.

This program will procure additional ALQ-99 jammer pod components peculiar to the EXCAP to ICAP II update and ICAP I MOD. These assets are required because of current inventory objective shortages, requirements of the U.S. Marine Corps threat spectrum revision, and reliability/maintainability improvements in existing pods.

Development Status: Development is complete. The Universal Exciter has Approval for Limited Production (ALP). Approval for Full Production (AFP) on the Universal Exciter will be received in June 1985. All other equipments have AFP.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$8,088		\$22,982		\$24,484		\$37,103		\$20,756
O&MN Install.						\$850		\$600		\$627
APN-6 Spares		\$921		\$1,431				\$7,415		1,748

OSIP 19-79

Project Financial Plan (Con't):

	FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$41,724		\$52,742		\$49,122		\$61,596	*	\$318,597
O&MN Install.		\$627		\$627		\$643				3,974
APN-6 Spares		\$822		\$3,049		\$2,248		\$2,368		20,002
GRAND TOTAL										\$342,573

\* Aircraft quantities not applicable.

Installation Data: Installation will be accomplished by Naval Weapons Support Center (NWSU) Crane, Indiana during pod refurbishment.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ICAP-I Update Program (Signal Data Converter/Digital Display/Inertial Navigation/AN/AYK-14 Computer) (OSIP 14-81)

Models of Aircraft Affected: EA-6B (ICAP I)

Description/Justification:

The requirements of OSIP 14-81 (SDC/INS) and OSIP 15-83 (AN/AYK-14) are combined under this OSIP. This is a combined effort to install the AN/ASN-123 signal data converter (SDC)/digital display group (DDG), the AN/ASN-130 inertial navigation system (INS), and replace the CFE AN/AYA-6 computer with the Navy standard AN/AYK-14 computer in the EA-6B ICAP aircraft. The SDC weapon replaceable assembly (WRA) is the highest failure component. Alone it accounts for 20 percent of all system failures. Despite the incorporation of eight separate engineering improvements, reliability is still not adequate to support minimal readiness standards. Also, the maintainability factors preclude improvements with existing equipments. This effort will provide for installation of the AN/ASN-123 navigational display system presently installed in the SH-3 helicopter and in EA-6B production aircraft.

The AN/ASN-130 inertial navigation system is a modern, accurate navigation system that will replace the present dead-reckoning doppler navigation system currently installed in the EA-6B. The doppler navigation system has not proven to be reliable and fails to provide the necessary accuracy for more effective employment of the EA-6B weapon system. The AN/ASN-130 is being installed in the EA-6B/F-18 production aircraft. This commonality will provide improved integrated logistic support, thereby enhancing system readiness while providing greatly increased operational effectiveness.

The AN/AYK-14 computer will replace the AN/AYA-6 computer. The AN/AYA-6 group has been high on the EA-6B readiness degradation list since 1977. Its mean time between failure (MTBF) over that period has averaged 40 hours. It has 32K memory (completely utilized) and an inadequate built in test (bit). The AN/AYK-14 has demonstrated six to seven times the AN/AYA-6 MTBF during ICAP II development. The AN/AYK-14 possesses 192K memory which will accommodate future growth, and full background and on demand bit. This change allows use of ICAP II software written in higher order language. This will standardize computer language in all versions of the EA-6B. The AN/AYK-14 also utilizes MILSTD 1553 interfaces which greatly simplifies the task of integrating future equipment such as the JTIDS, GPS, and ALQ-149 into the EA-6B.

This combined effort will reduce total installation cost while at the same time measurably enhancing reliability, improve readiness, and lessen life cycle cost requirements.

OSIP 14-81

Development Status: This installation will be a retrofit application of the existing AN/ASN-123 with a form-fit-function installation developed by Grumman. The AN/ASN-123 is approved for full production and has approval for limited production in the EA-6B. The AN/ASN-130 has approval for full production (AFP). The AN/AYK-14 development is complete. Navy TECHEVAL and COMFVAL were completed in April 1983.

	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (SDC/AYK-24)		\$1,066	11/0	\$9,471	10/11	\$22,749*	10/10	\$13,742	10/10	\$18,103	3/10	\$14,582
O&MN Install.								\$506		\$496	(12)	\$3,626
O&MN Training								\$80				
APN-6 Spares				\$3,380		\$1,773		\$1,052		\$813		-0-

	FY 1987	FY 1988	FY 1989	FY 1990	TOTAL
	Qty	Cost	Qty	Cost	Qty
			Cost		Cost
APN-5 (SDC/AWK-14)	O/10	\$12,559	O/6	\$4,377	51/57
O&MN Install.	(12)	\$38,828	(12)	\$38,828	\$ 96,648
O&MN Training					181,166
APN-6 Spares					80
					7,058

NOTE: \$9,152 of this total was executed under OSIP 15-83 (AYK-14)

NOTE: \$9,152 of this total was executed under contract number EA-6B Standard Depot Level

Installation Data: Installation will be accomplished by the contractor concurrent with EA-6B Standard Depot Level Maintenance (SDLM).



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: EA-6A Radar and Navigation Update (OSIP 53-82)

Models of Aircraft Affected: EA-6A

Description/Justification:

Currently, the APO-103 radar group constitutes one of the highest readiness degradations in the EA-6A. This results from the obsolete tube type design; which is a direct derivation from the A-6A APQ-92 fire control weapon system. Further, with the removal of the A-6A from Fleet service and its replacement by the A-6E, and with the retrofit of the APS-133 into the EA-6B, the logistic support posture of the APQ-103 becomes untenable. Retrofit of the APS-133 into the EA-6A will increase the mean time between failure (MTBF) to 118 hours. This improvement is essential due to the importance of the search radar in determining aircraft positioning (as retrofit of an inertial navigation system (INS) is not contemplated).

The installation of the APS-133 radar in the EA-6A will upgrade the radar system. Additionally, the entire navigation and attitude reference system will be updated with systems including the APN-200, ASN-50, ARA-63, APN-154, and AJB-3.

The requirements of OSIP 57-70 (DECM Improvements) and OSIP 53-82 (Radar and Navigation Update) for FY 1984 and subsequent have been combined under this OSIP.

Development Status: All new items are approved for full production.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	7	\$5,888	3	\$2,783	3	\$4,229	3	\$8,121	3	\$5,402
O&MN Install.			(1)	\$74			(4)	\$622	(6)	\$942
O&MN Training		\$190				\$200				
APN-6 Spares		\$1,460		\$299		\$231				

OSIP 53-82

Project Financial Plan (Cont'd):

	<u>FY 1987</u>		<u>FY 1988</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5						
O&MN Install.	(5)	\$775	(3)	\$465	19	\$26,423
O&MN Training						2,878
APN-6 Spares						390
						<u>1,950</u>
GRAND TOTAL						\$31,681

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLN).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Fire Protection System (OSIP 129-85)

Models of Aircraft Affected: EA-6B

Description/Justification:

Based on aircraft incident reports and analysis, several EA-6 areas have been identified as potential fire hazard areas, i.e., engine bays and taildeck/birdcage areas. Fire detection/extinguishing systems have proved their value by saving aircraft during fire incidents on the F-14 and F-18. In order to improve the fire protection capability of the EA-6 aircraft it is proposed to incorporate a fire extinguishing system for engine bay protection and to extend fire detection and extinguishing to other compartments conducive to the detection/extinguishing means of fire protection. Additionally, bleed air leak detection systems will be incorporated to provide coverage of bleed air ducts that can cause safety hazard or excessive damage upon a bleed air leak.

Development Status: Bleed air leak/fire detection and fire extinguishing systems are incorporated on several aircraft, i.e., F-14, F-18. The fire extinguishing is in accordance with MIL-E-22295 and the detection systems are in accordance with MIL-F-7872 or MIL-F-22447.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APH-5	30	\$2,056	40	\$2,216	23	\$1,249	93	\$5,521		
O&M Install.			(30)	\$627	(40)	\$836	(23)	\$481		1,944
O&M Training		\$25								25
APH-6 Spares		\$132		\$145		\$87				354
GRAND TOTAL										\$7,854

Installation Data: Installation of the fire protection system will be accomplished by designated Standard Depot Level Maintenance (SDLM) site or Field Mod Team (FMT).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: TF-41 Engine Hot Section Extended Life Program (HELP) (OSIP 16-81)

Models of Aircraft Affected: A-7E

Description/Justification:

Component improvements, previously designed and tested to assure achievement of a 500-hour non-derated hot section repair capability (Lead the Fleet Component - HPT-1 Vane), began service incorporation April 1979. Incorporation of further hot section and control component redesigns are required to improve operational readiness, to reduce the risk of critical turbine part failure, minimize the cost of ownership, and provide the capability to maintain engine performance throughout a 1000-hour service interval. These hardware changes will collectively restore the TF-41 engine to cost effective levels of reliability and performance by increasing turbine durability and reducing peak hot section temperatures. State-of-the-art technology and greater contractor expertise are reflected in the redesigns.

Improved operational readiness will be attained by increasing the availability of the TF-41 engine. The engine configuration resulting from the Lead the Fleet ("LTF") program (OSIP 4-78) will require hot section refurbishment (engine disassembly) at 500-hour intervals due to HPT-1 vane distress and relatively low life limited components within the high pressure turbine section. The causes of the distress and relatively low life limits are high peak temperatures produced by the existing combustors, basic design of the existing HPT-1/-2 blade attachments, insufficient HPT-1/-2 blade airfoil capability to withstand even limited elevated temperature exposure, metal cooling capability of even the "LTF" bullnose HPT-1 vane configuration, and an inefficient electronic control (LTA) which does not effectively limit transient temperature overshoots and is adversely affected by common mode noise input to the T5.1 circuits. Because of these problems, the currently approved configuration hardware is life limited as follows; HPT-1/-2 blades - 1000 hours (not addressed by "LTF"); and HPT-1/-2 wheels - 2500 hours (not addressed by "LTF"). The cost and resultant operational readiness impact as a result of these relatively low life limits of the current configuration are inherently high.

Description/Justification (Cont'd):

This modification program addresses the above deficiencies with kits A through D. Kit A provides a three-lobe serration HPT-1 cast blade with a 2000-hour minimum airfoil life and an HPT-1 wheel with a 6000-hour life limit. Kit B provides a three-lobe serration air-cooled HPT-2 blade with a 2000-hour minimum life and an HPT-2 wheel with a 6000-hour life limit. It will also provide for the replacement of hardware considered to be very sensitive to handling damage which has been linked to several recent Fleet mishaps involving aircraft losses. Kit D provides for an Engine Monitoring System (EMS) which continuously defines engine health status, hot section component usage, and performance characteristics to ensure early detection of engine discrepancies and to improve maintenance effectiveness. Kit D also provides increased flight safety by pilot warning of engine vibration and "quiet" stall. (NOTE: Several Fleet aircraft have recently been lost due to low engine performance and "quiet" stall).

The improvements provided by this program combined with development efforts which began incorporation in April 1979 ("LTF") will result in a TF-41 engine with the capability for a 1000-hour refurbishment interval, a projected inherent premature removal rate of less than 2.0 per thousand hours, and a projected combined inherent premature removal rate of 4.0 per thousand hours. The new HELP kit improvement will increase the HP Turbine's tolerance to overtemperature effects due to stall. This modification program will extend the useful life of the high pressure hot section components thereby reducing inspection requirements and replacement parts costs. These improvements will provide additional turbine temperature capability. This capability can be used to maintain engine performance following prolonged operation by permitting depreciation recovery as required. The EMS will provide the engine component life usage tracking and performance degradation trend capabilities required by the CNO directed Navy-wide Engine Analytical Maintenance Program (EAMP). These capabilities coupled with the EMS ability to increase troubleshooting will improve aircraft availability, reduce unnecessary engine and component removals, decrease secondary material damage, increase logistics support effectiveness, and extend useful engine operational life. The incorporation of these improved hot section components with the cockpit warning feature of the EMS will significantly improve the A-7E flight safety record. The result of this total modification program will be a cost effective end item with improved reliability and combat readiness with significantly reduced logistics costs and increased safety.

Development Status: Kit A, B, and D development is complete. Kits A, B, and D are developed such that each kit can be incorporated as an individual entity.

Project Financial Plan:

Installation Data: Kits A and B will be incorporated during scheduled engine/HPT rotor repair at depots. Modified HPT rotors will be installed at depots and IMA's. Kit D will be incorporated during scheduled engine repair at the depots. Concurrent with scheduled aircraft Standard Depot Level Maintenance (SDLM), by the Naval Air Rework Facility (NARF) field mod team, and by intermediate level maintenance activities.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-162 Countermeasures Set Provisions (OSIP 141-84)

Models of Aircraft Affected: A-7E

Description/Justification:

This OSIP provides for the AN/ALQ-162 installation provisions. The AN/ALQ-162 GFE in FY 1985 and subsequent is contained in the AN/ALQ-162 OSIP 115-85.

The AN/ALQ-162 provides complementary CW jamming to the operational AN/ALQ-126B pulse jammer installed in tactical aircraft. The AN/ALQ-162 will accept threat handoff data from the AN/APR-43 Radar Warning Receiver and utilize a common transmit/receive antenna integral to the AN/APR-43 antenna assembly. The AN/ALQ-162 also provides a stand alone capability allowing for defensive electronic countermeasures in event of AN/APR-43 failure. The AN/ALQ-162 design is fully reprogrammable to handle future threat parameter changes. The AN/ALQ-162 provides a significant increase in survivability for Navy Tactical aircraft against radar directed air defense weapons.

Development Status: Northrop Defense Systems Division is under contract and provided engineering development models in the second quarter of FY 1981 for test and evaluation. TEMP No. 593 supports Navy test and evaluation. The RDT and TECHEVAL are complete. Approval for limited production (ALP) is expected in the second quarter of FY 1985. RDT&L,N Program Element Number 64224N applies.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
AFN-5	4	\$1,382	76	\$7,126	72	\$4,976	71	\$4,555		
O&MN Install.					(2)	\$27	(62)	\$921	(88)	\$1,176
O&MN Training						\$75				
APN-6 Spares		\$12		\$763		\$495				

OSIP 141-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		223 \$18,039
O&MN Install.	(71) \$949	3,083
O&MN Training		75
APN-6 Spares		<u>1,270</u>
GRAND TOTAL		\$22,467

Installation Data: Installation of the airframe change kit will be accomplished during Standard Depot Level Maintenance (SDLM) and by Naval Air Rework Facility (NARF) Field Modification Teams (FMT).



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Aircraft SLEP Rewire (OSIP 170-85)

Models of Aircraft Affected: A-7E

Description/Justification:

The A-7E CILOP/SLEP Final Report, 15 Aug 76; and, the A-7E Wiring Investigation Final Report, 20 Aug 82, concluded that the A-7E aircraft needed to be completely re-wired 10 to 12 years after the aircraft was put into service. The average age of the A-7E aircraft is approaching 12.5 years. All relevant changes will be incorporated to establish a baseline configuration. Starting with this baseline a new wiring system for the A-7E will be designed. Variations for unincorporated changes will be accomplished by designing alternate configurations. This new design will incorporate new specifications for state-of-the-art improvements in wire composition insulation, terminations, connectors and new improved shielding. The total number of splices will be reduced and, where splices are required, only environmental splices will be used. The 212 pin connector will be eliminated. A different specification, more compatible series of metals will be used on pylon and leading edge hard harnesses installation. The problem of not being able to replace wires in hard harnesses will be resolved. Severe chafing in the nose wheel will due to current routing will be resolved. The instrument panel wiring installation will be modified and upgraded to allow for future change and additional circuits. Special additional protective covering of wire harnesses in areas where fluids (hydraulic, fuel, etc.) accumulate will be incorporated. This new design will reduce maintenance manhours and ensure that the A-7E fulfills its service life cycle requirements.

Development Status: All aircraft wiring will be replaced by a new design utilizing updated new specification wire, insulation, shields, connectors, and connector mating devices. All outstanding AVC's AFC's AFC's, IAYC's, IAFIC's, Bulletins, RAMECS and Class II changes will be incorporated. A baseline design will be established. Variations will be designed to account for unincorporated changes. Prototype and validation verification testing will be performed. No Approval for Limited Production/Approval for Full Production (ALP/AFP) is required.

OSIP 130-85

Project Financial Plan:

	<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>		<u>FY 1988</u>		<u>FY 1989</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	1	\$6,758	6	\$4,042	33	\$20,025	20	\$11,621	(20)	\$2,822	60	\$42,446
O&MN Installi.					(7)	\$988	(33)	\$4,656				8,466
APN-6 Snares				\$193		\$817						<u>1,010</u>
GRAND TOTAL												\$51,922

Installation Data: AFC Kits will be manufactured by Vought Corporation, and installation will be performed by the Naval Air Rework Facility, Jacksonville, during Standard Depot Level Maintenance (SDLM) and drive-in modification programs.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Digital Engine Control System (OSIP 88-85)

Models of Aircraft Affected: AV-8B

Description/Justification:

Digital Engine Control Systems (DECS) will replace the hydro-mechanical fuel control in AV-8B Low Rate Production and subsequent aircraft. Structural and systems changes are required to accommodate DECS. Redundant total temperature sensors; wiring for DECS power, control, and sensor signals; and fuel system and engine control modifications will be provided. Additionally, DECS control switches and advisory indicators will be added to the cockpit. Only the 12 Pilot Production aircraft require AFC kits. However, 61 engines will require modification.

Development Status: Full Scale Development (FSD) will be conducted in accordance with the AV-8B/GR-5 Arrangement. Preliminary Flight Rating Test (PFRT) will complete in March 1985; Flight Test at Edwards AFB will complete in June 1985; and Engineering Change Proposal (ECP) was confirmed in January 1985.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	22	\$8,147	18	\$5,807	21	\$6,107	(18)	\$554	(21)	\$646	61*	\$20,061
O&MN Install.					(22)	\$677						1,877
O&MN Training				\$75								75
APN-6 Spares		\$1,854		\$776		\$1,153						3,783
GRAND TOTAL												\$25,796

\*Quantity represents engines.

Installation Data: Installation will be accomplished by contractor field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Engine Monitoring System (EMS) (OSIP 89-85)

Models of Aircraft Affected: AV-8B

Description/Justification:

EMS increases flight safety. It provides pilot warning of engine problems, documents engine stalls, documents engine operating limitation breaches, provides automated hover checks, and tracks engine operational usage cycles. Additionally, EMS provides real time engine health status, including hot section component usage and performance degradation. The FY 1985 program start minimizes both supportability requirements and retrofit costs.

Development Status: Full Scale Development (FSD) will be conducted in accordance with the AV-8B/GR-5 Arrangement and the Component Improvement Program. Preliminary Flight Rating Test (PFRT) will complete in March 1985; Flight Test at Edwards AFB will complete in May 1985; and Engineering Change Proposal (ECP) will be confirmed in February 1985.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	18	\$4,201	15	\$2,316	(18)	\$1,482	(15)	\$1,235	33	\$ 6,945
O&MN Install.						\$428				2,717
O&MN Training				\$100						100
APN-6 Spares		\$506		\$324		\$60				890
GRAND TOTAL										\$10,652

Installation Data: Installation will be accomplished by contractor field team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Follow-on Structural Fatigue (OSIP 18-81)

Models of Aircraft Affected: F-4S

Description/Justification:

The F-4J to S conversion program (OSIP 4-76) basically incorporated structural improvements in the F-4J whose service life has expired, to permit extension of the service life by an additional eight years, with concurrent installation of wing leading edge slats to enhance maneuvering performance. This was the first time a fleet of operational fighter aircraft will have remained in service for such an extended period of time (18 years total).

The full scale F-4S fatigue test has identified structural failure areas and recorded failure histories for advance planning and budgeting of structurally significant items throughout the "second" life of the F-4J(S).

Structural improvements will consist of fixing known problem areas which have been identified since approval of the F-4 CILOP, with follow-on engineering change proposals (ECP's) generated throughout the 8-year service life extension period in a timely manner based on the full scale fatigue testing.

Development Status: Current full-scale fatigue testing has resulted in the decision to incorporate 0° leading edge flaps (inboard), an improved center line splice, and an improved fin cap assembly. Additional requirements are being identified as a result of structural fatigue testing.

Project Financial Plan:

	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$216		\$1,410	(16)	\$1,309		\$2,457		\$2,276		\$2,108
CMW Install.						\$1,342	(51)	\$4,323	(55)	\$5,352	(50)	\$4,598
APN-6 Spares												-0-

OSIP 18-81

Project Financial Plan (Cont'd):

	FY 1987		FY 1988		FY 1989		FY 1990		FY 1991		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$1,857		\$1,912		\$1,279		\$626		\$595	*	\$15,450
O&MN Install.	(50)	\$4,580	(18)	\$765	(47)	\$1,998	(30)	\$1,275	(14)			24,328
APN-6 Spares												-0-
GRAND TOTAL												\$39,778

\*Quantity being procured are kits vice aircraft.

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) during SLEP and during Standard Depot Level Maintenance (SDLM) and drive-in mod.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APR-43 Provisions (OSIP 39-86)

Models of Aircraft Affected: F-4S

Description/Justification:

This OSIP provides for the AN/APR-43 installation provisions. The AN/APR-43 GFE in FY 1985 and subsequent is contained in the AN/APR-43 OSIP 113-85.

The AN/APR-43 is a radar/missile warning receiver which provides mission essential warning and direction finding for CW threat systems. The APR-43 augments and is fully integrated with the AN/ALR-45F. The system is a form factor replacement for the AN/ALR-50, and as such keeps airframe changes to a minimum.

Development Status: TECHEVAL and OPEVAL have been completed in the A-7E. Approval for Limited Production (ALP) for 57 units was granted in October 1983. FOT&E is ongoing in the AV-8C and is planned for completion in mid FY 1985. Additional FOT&E will be carried out in the RF-4B and F-4S aircraft in FY 1985/FY 1986. Approval for Full Production (AFP) for the A-7E aircraft is planned for the second quarter FY 1985.

Project Financial Plan:

	FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$1,846			1	\$1,846
O&MN Install.			(1)	\$37		37
APN-6 Spares		\$73				73
GRAND TOTAL						\$1,956

Installation Data: Installation will be accomplished by Naval Air Rework Facility (NARF) and by Field Teams.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-162 Countermeasures Set Provisions (OSIP 40-86)

Models of Aircraft Affected: F-4S

Description/Justification:

This OSIP provides for the AN/ALQ-162 installation provisions. The AN/ALQ-162 CFE in FY 1985 and subsequent is contained in the AN/ALQ-162 OSIP 115-85.

The AN/ALQ-162 provides complementary CW jamming to the operational AN/ALQ-126B pulse jammer installed in tactical aircraft. The AN/ALQ-162 will accept threat handoff data from the AN/APR-43 Radar Warning Receiver and utilize a common transmit/receive antenna integral to the AN/APR-43 antenna assembly. The AN/ALQ-162 also provides a stand alone capability allowing for defensive electronic countermeasures in event of AN/APR-43 failure. The AN/ALQ-162 design is fully reprogrammable to handle future threat parameter changes. The AN/ALQ-162 provides a significant increase in survivability for Navy tactical aircraft against radar directed air defense weapons.

Development Status: Northrop Defense Systems Division is under contract and provided engineering development models in the second quarter of FY 1981 for test and evaluation. TEMP No. 593 supports Navy test and evaluation. The RDT and TECHEVAL are complete. Approval for Limited Production (ALP) is expected in the second quarter of FY 1985. RDT&E,N Program Element Number 64224N applies.

Project Financial Plan:

	FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$1,058			1	\$1,058
O&MN Install.			(1)	\$93		93
APN-6 Spares		\$2			2	2
GRAND TOTAL						\$1,153

Installation Data: Installation of the airframe change kit will be accomplished by Naval Air Rework Facility (NARF) Field Teams.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-162 Countermeasures Set Provisions (OSIP 128-84)

Models of Aircraft Affected: RF-4B

Description/Justification:

This OSIP provides for the AN/ALQ-152 installation provisions. The AN/ALQ-162 GFE in FY 1985 and subsequent is contained in the AN/ALQ-162 OSIP 115-85.

The AN/ALQ-162 provides complementary CW jamming to the operational AN/ALQ-126B pulse jammer installed in tactical aircraft. The AN/ALQ-162 will accept threat handoff data from the AN/APR-43 Radar Warning Receiver and utilize a common transmit/receive antenna integral to the AN/APR-43 antenna assembly. The AN/ALQ-162 also provides a stand alone capability allowing for defensive electronic countermeasures in event of AN/APR-43 failure. The AN/ALQ-162 design is fully reprogrammable to handle future threat parameter changes. The AN/ALQ-162 provides a significant increase in survivability for Navy tactical aircraft against radar directed air defense weapons.

Development Status: Northrop Defense Systems Division is under contract and provided engineering development models in the second quarter of FY 1981 for test and evaluation. TEMP No.593 supports Navy test and evaluation. The RDT and LECHEVAL are complete. Approval for limited production (ALP) is expected in the second quarter of FY 1985. RDT&E,N Program Element Number 64224N applies.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$722			12	\$843	14	\$990			27	\$2,555
OSMN Install.			(1)	\$24			(12)	\$358	(14)	\$418		800
APN-6 Spares		\$1				\$80						81
GRAND TOTAL												\$3,436

Installation Data: Installation of the airframe change kit will be accomplished by Drive-in Mod and by Field Teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APR-43 Provisions (OSIP 143-84)

Models of Aircraft Affected: RF-4B

Description/Justification:

The AN/APR-43 is a radar/missile warning receiver which provides mission essential warning and direction finding for CW threat systems. The APR-43 augments and is fully integrated with the AN/ALR-45F. The system is a form factor replacement for the AN/ALR-50, and as such keeps airframe changes to a minimum.

This OSIP provides for the AN/APR-43 installation provisions. The AN/APR-43 GFE in FY 1985 and subsequent is contained in the AN/APR-43 OSIP 143-85.

The AN/APR-43 is a radar/missile warning receiver which provides mission essential warning and direction finding for CW threat systems. The APR-43 augments and is fully integrated with the AN/ALR-45F. The system is a form factor replacement for the AN/ALR-50, and as such keeps airframe changes to a minimum.

Development Status: TECHVAL and OPEVAL have been completed in the A-7E. Approval for Limited Production (ALP) for 57 units was granted in October 1983. FOT&E is ongoing and is planned for completion in mid FY 1985.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$2,805	(1)	\$31	14	\$439	12	\$395	(12)	\$446	27	\$3,639
O&MN Install.							(14)	\$520				997
APN-6 Spares												44
GRAND TOTAL						\$44						\$4,680

Installation Data: Installation will be accomplished by Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM) and by Field Teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: TF30-P-414A Package (OSIP 15-82)

Models of Aircraft Affected: F-14A

Description/Justification:

This program consists of 25 separate engine improvements and associated aircraft changes required to ensure long term reliability, supportability and safety of the TF30 in the F-14 aircraft. The improvements provide significant increases in component low cycle fatigue life, engine stall margin and overall durability. The retrofit kit procurement provides the only source of hardware to replace components that reach currently imposed low cycle fatigue life limits. Thus, a specific procurement schedule is required to ensure hardware availability for those replacements and to avoid the negative effect of aircraft with bare firewalls if the hardware were not available. The incorporation of the 25 changes will result in a new model of the TF30 engine - TF30-P-414A.

Development Status: Component testing completed in February 1982. Two engines each completed in excess of 2400 hours of Accelerated Simulated Mission Endurance Testing (ASMET) by February 1982. Production effectivity is aircraft #462.

OSIP 15-82

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	126	\$57,245	217	\$98,857	296	\$116,097	230	\$109,612	118	\$57,286
O&MN Install.			(110)	\$12,840	(233)	\$27,452	(240)	\$28,490	(240)	\$28,490
APN-6 Spares		\$3,616		\$6,724				\$4,029		\$3,889

	FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	14	\$34,906		\$33,340	1,001	\$507,343
O&MN Install.	(130)	\$15,441	(48)	\$5,571		118,284
APN-6 Spares						18,258
GRAND TOTAL						\$643,885

Note: Quantity represents engines to be modified.

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM) and by field teams. Engine installation O&MN funding includes rework costs.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Television Camera Sight (TCS) (OSIP 62-82)

Models of Aircraft Affected: -14A

Description/Justification:

The television camera sight (TCS) will provide the pilot and radar intercept officer (RIO) of an F-14A the ability to visually identify airborne targets at long stand-off ranges during day clear weather conditions. The TCS significantly enhances the F-14A weapon systems effectiveness and survivability whenever operational conditions dictate positive target ID prior to attack.

Development Status: Approval for service use was granted in January 1981. Production incorporation commenced with aircraft #465.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	66	\$11,383	84	\$14,386	130	\$14,126	118	\$17,367	*	\$7,937
CAAMN Install.			(10)	\$260	(135)	\$4,493	(118)	\$2,456	(187)	\$5,965
APN-6 Spares		\$54;		\$2,826		\$140				-0-

OSIP 62-82

Project Financial Plan (Cont'd):

	FY 1987		TOTAL	
	Qty	Cost	by	Cost
APN-5			398	\$58,199
O&MN Install.	(18)	\$413		13,587
APN-6 Spares				<u>3,507</u>
GRAND TOTAL				\$75,293

\*Cameras only.

Installation Data: Installation will be performed by contractor field mod teams with one Naval Air Rework Facility (NARF) (PFMT) Field Mod team and by Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Secure Link-4A (OSIP 97-82)

Models of Aircraft Affected: F-14A

Description/Justification:

The present Link-4A installation in the F-14 and E-2C is highly vulnerable to jamming/interference thus limiting its usefulness. This modification will provide anti-jam protection for the Link-4A, the digital link used for target data exchange between E-2 and F-14A by adding a spread spectrum adapter to the existing data link equipment. The modification will serve as an interim capability until introduction of the Joint Tactical Information Distribution System (JTIDS) in the early 1990's. In view of the vital role of the F-14 and E-2C in Fleet Air Defense, it is imperative that the Link-4A data not between them be protected against jamming by an adversary. Harris Corporation has designed, developed and demonstrated a system with very highly satisfactory results. Subsequently, NAVAIR has received strong endorsements of the modification from COMNAVAIRLANT, COMNAVAIRPAC, CINCLANTFLT, CINCPACFLT, TACWINGSLANT and others recommending immediate action to introduce the change into the fleet as an operational expediency. This CSIP will facilitate early introduction into fleet inventory. Harris is the sole designer and developer of this modification, and in addition, is the designated depot for repair, and the sole producer of all ground support equipment.

Development Status: A feasibility and implementation study and a laboratory demonstration were completed in December 1979. Prototype one-way flight test was completed in October 1980. Two-way flight evaluation was completed successfully at NATC in April 1983. A DT-III was started late FY 1984 to verify corrections to design deficiencies concurrent with the development of fighter-to-fighter software. At completion of DT-III and software development, a fleet evaluation will be conducted late FY 1985.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$4,120	19	\$11,696			40	\$4,387	80	\$13,354	100	\$15,805
O&MN Install.					(19)	\$4,425		\$930	(40)	\$1,536	(80)	\$2,764
APN-6 Spares						\$517		\$1,096		\$1,843		\$1,529

OSIP 97-82

Project Financial Plan (Cont'd):

	<u>FY 1989</u>		<u>FY 1990</u>		<u>FY 1991</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	100	\$12,789	80	\$9,447			419	\$ 76,023
O&MN Install	(100)	\$3,509	(100)	\$3,667	(80)	\$3,154		16,077
APN-6 Soares		\$2,119		\$1,889				8,476
GRAND TOTAL								\$100,576

Installation Data: Installation will be accomplished at the contractor's facility.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Structural Fatigue Modification (OSIP 115-82)

Models of Aircraft Affected: F-14A

Description/Justification:

This is an omnibus structural modification package containing fixes for the areas found to be deficient during the #98 fatigue tests and the Main Landing Gear (MLG) piston fatigue tests.

F.S. 569 Bulkhead - During the 4000 hour inspection on the aircraft #98 fatigue test article and subsequent inspection of aircraft #105 at Standard Depot Level Maintenance (SDLM), cracks were discovered in the bulkhead centerbody flange radius on both the left and the right hand sides. ECP 1116 (Correction of Deficiency) will modify the bulkhead nacelle to centerbody flange by the addition of angles and snibs in production and retrofit aircraft to eliminate the possibility of further cracking in the F.S. 569 area. During the inspection made after failure of the 533 bulkhead, cracks were found in the nacelle area at F.S. 569. ECP-1125 will add interference fit fasteners in this area to eliminate the possibility of cracking in fleet aircraft. ECP 1124 corrects problems in the areas of: F.S. 569 Breather Joint, B.L. 26 Skin Strap, F.S. 569 Forward Fixed Cowl, F.S. 539 and 545 Ring Frames, and F.S. 533 Door Stop Angles.

F.S. 533 Bulkhead - During fatigue tests on aircraft #98, the fuselage station 533 bulkhead failed at 4,584 spectrum hours. ECP 1118 (Correction of Deficiency) will provide structural modifications of various fuselage stations (F.S. 533 Breather Joint, F.S. 345 B. L. 26 Skin Strap, F.S. 569 Forward Fixed Cowl Shir, F.S. 539 and F.S. 545 Ring Frames) to improve fatigue life in production and retrofit aircraft. ECP 1123 (Correction of Deficiency/Operational Improvement) will provide for production and retrofit incorporation of interference fit fasteners to the right and left hand side of the F.S. 533 bulkhead and new door stop angles and plates to span F.S. 533.75.

Main Landing Gear - A failure of the lower torque arm pin occurred at 8,944 landings during contractor conducted main landing gear piston fatigue tests. Further investigation revealed that both upper and lower pins were cracked. The problem was traced to an undercut radius at the head of the pin. ECP 1107 (Correction of Deficiency) will replace the present upper and lower torque arm pins on the MLG with modified pins. The Main Landing Gear retract actuator pin was discovered to be deficient in fatigue life. ECP 1132 (correction of Deficiency) will replace the MLG retract actuator pin with one designed to have increased fatigue life and a higher resistance to stress corrosion. The MLG Drag Brace Assembly Knee pin and Universal Fitting have calculated fatigue lives lower than the specification requirement of 15,600 landings. The reduction on fatigue life is attributed to undercuts at the head of the Knee pin and at the lug of the Universal Fitting. ECP's 1168 and 1169, respectively, will correct these deficiencies.

OSIP 115-82

Description/Justification (Cont'd):

Tension-Compression Fittings - Several fleet aircraft were discovered to have cracked T-C Fittings. Subsequent inspection of these fittings on aircraft #98 revealed cracks that began at approximately 6000 test hours. ECP 1167 corrects this problem through the installation of a new design T-C fitting on the Forward and Aft Fixed Cowls as well as the Daily and Weekly doors.

Development Status: Grumman Aerospace Corporation aircraft #98 fatigue tests and MLG fatigue tests provided failure data. No approval for full production (AFP) is required.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost

APN-5  
O&MN Install.  
APN-6 Spares

		\$1,581		\$2,726		\$420		\$4,984		\$6,949		\$3,640
				\$12		\$74		\$5,340		\$6,560		\$6,700
												-0-

	FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost

APN-5  
O&MN Install.  
APN-6 Spares

		\$3,403		\$5,036		\$23,283
		\$8,871				32,927
						86

GRAND TOTAL

\$56,296

Installation Data: Installation will be accomplished at Depot level during Standard Depot Level Maintenance (SDLM) and by drive in mod.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Structural Improvements (OSIP 152-83)

Models of Aircraft Affected: F-14A

Description/Justification:

A full scale fatigue test is presently being conducted with F-14 shop number 98. 10,300 test hours have been completed. Six required structural engineering change proposals (ECP's) were identical in the first 4,600 hours of testing and were funded under OSIP 115-82. Seventeen additional modifications have been identified to date and are being grouped into four additional ECP's to be installed on fleet aircraft at or before 3,000 flight hours. The following modifications will be installed under this OSIP:

- Replace wing attachment 'Y' fitting
- Replace engine attachment stub duct
- Reinforce the Sta 569 nacelle inboard flange
- Install redesigned fittings in the upper and lower diverter area
- Install redesigned upper sponson panel
- Reinforce the centerline trough web
- Reinforce bulkhead and support structure at F.S. 395
- Reinforce upper and lower deck skins
- Reinforce nacelle assembly at F.S. 533
- Modify bushing fitting for the wing attachment 'Y' fitting
- Install redesigned lower longeron side beam
- Install redesigned wheel well support in the inlet duct assembly
- Modify longeron at F.S. 569
- Reinforce longitudinal flight control support bracket
- Install interference fit fasteners in the vertical fin assembly
- Tridair Panels - Corrosion
- Install interference fit fasteners at F.S. 569

Development Status: Complete.

Protect Financial Plan:

Installation Data: Installation will be accomplished at depot level during drive in mod.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Increased Wall Thickness of Main Landing Gear (OSIP 9-84)

Models of Aircraft Affected: F-14A

Description/Justification:

This engineering change will increase the thickness of the main landing gear shock strut piston wall from 0.494 inches to 0.744 inches. This is being done to eliminate the cracking and subsequent failures being experienced with the current piston. For retrofit, this will require the installation of a new inner piston.

To date, Navy squadrons have experienced ten instances of cracked gear struts. Frequently, these failures occur immediately after catapult launch or during carrier arrestment, both extremely critical phases of flight. To preclude hazardous aircrews and aircraft by exposing them to these potentially catastrophic landing gear failures, fleet squadrons have been inspecting all F-14A main landing gear assemblies as often as every 150 flight hours. Plugs are also being installed in the pistons in the present thin wall plug as an interim measure to extend their fatigue life until replacement with thick walled pistons is possible.

Development Status: Production effectivity was aircraft #461, delivered in April 1983. No approval for full production (AFP) is required.

CSIP 9-8u

Project Financial Plan:

	<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>		<u>FY 1988</u>		<u>FY 1989</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	87	\$11,845	97	\$14,470	103	\$17,001	103	\$18,668	(97)	\$587	(103)	\$623
O&MN Install.												
APN-6 Spares		\$2,102										

-0-

	<u>FY 1990</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5			390	\$61,984
O&MN Install.	(103)	\$623		2,359
APN-6 Spares				<u>2,102</u>
GRAND TOTAL				\$67,045

Modification is scheduled for Standard Depot Level Maintenance (SDLM) via an Accessory Change (AYC).

Installation Data:

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: F-14A Weapons Rail Operational Improvement (OSIP 43-85)

Models of Aircraft Affected: F-14A

Description/Justification:

Weapons rails are in a state of extreme deterioration due to water and cleaning solution intrusion; wiring insulation and connector breakdown; binding, bending, interference and non-confidence in mechanical linkage; unsatisfactory fasteners; and the inability to test the PHOENIX weapon system prior to take off on the carrier deck due to electromagnetic interference (EMI). PHOENIX capability is dependent on implementation of this program.

Development Status: No Approval for Full Production (AFP) is required. This will be a modification of the harnesses and connectors to correct EMI and maintenance problems. An EMI study by Grumman was initiated to verify that the redesigned weapon rails meet the latest specification requirements. This study was completed in June 1982.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	100	\$1,270	300	\$5,378	300	\$5,652	300	\$5,927	300	\$6,212
OMN Install.	(50)	\$297	(300)	\$1,780	(300)	\$1,860	(300)	\$1,943	(300)	\$2,030
APN-6 Spares		\$59		\$269						

OSIP 43-85

Project Financial Plan (Cont'd):

	<u>FY 1990</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(50) \$310	1,300* \$24,439
APN-6 Spares		8,220
		<u>328</u>
GRAND TOTAL		\$32,987

\*Quantity listed is rails.

Installation Data: Installation will be accomplished by the contractor.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: MXU-611 Jettison Release Mechanism (OSIP 42-86)

Models of Aircraft Affected: F-14A

Description/Justification:

Current system design for the MXU-611 Jettison Release Mechanism has no provision for electrical safeing. The wiring harness must be disconnected every time the system requires safeing (maintenance, aircraft moved to hanger deck, etc.). This results in frayed cables and consequent electromagnetic interference (EMI) hazards as well as expensive repair and down time. Additionally, there have been instances of cartridge blow out due to inadvertent locked-shut firing of the MXU-611 resulting in injuries to personnel and damage to aircraft.

To correct the above deficiencies it is necessary to modify the system design for the MXU-611 to include electrical safeing. This will require addition of electrical switches in the firing circuits, stray voltage sensors, electrical lines to power the safeing devices, reinforcement of the breech walls or addition of a gas vent, and changes to the mechanical safety handle linkage systems.

Electrical safeing is estimated to save 12,000 maintenance manhours per year as follows:

2 men .12 hour each for every pre flight to rearm (activate) MXU-611  
2 men .12 hour each for every post flight to disarm (deactivate) the MXU-611  
2,500 sorties per year with auxiliary external fuel tanks (1982 data).

Additional maintenance hours and down time savings will be realized from decreased wiring harness repair. Approximately 50% of aircraft require harness repair of 16-24 hours each cruise.

Development Status: Initial design investigation by the contractor has begun and the design approach has been firmed up. Approval for Full Production not required.

Project Financial Plan:

Installation Data:

5-80

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: OV-10A to D Conversion (OSIP 61-84)

Models of Aircraft Affected: OV-10A

Description/Justification:

The OV-10D (NOS) aircraft provides the USMC with a capability to locate enemy troops, artillery positions and armor under conditions of low visibility, night and masking. The Laser Ranging Detecting System permits target designation for laser guided weapons organic to the fleet. Conversion of 30 additional aircraft will provide the Fleet with additional mission effectiveness, and provide service life extension of these aircraft.

Development Status: The OV-10A to OV-10D (NOS) modification program for 18 aircraft was completed in late November 1980. Approval for full production (AFP) is in process and will be completed by June 1985.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$2,568	6	\$31,989	10	\$41,473	7	\$35,146	7	\$32,365
O&MN Install.							(6)	\$1,971	(10)	\$3,285
O&MN Training								\$335		
APN-6 Spares				\$7,133		\$5,100		\$6,602		\$5,972

OSIP 61-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>		<u>FY 1990</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5						
O&MW Install.	(7)	\$2,300	(7)	\$2,300	30	\$143,541
O&MN Training						9,856
APN-6 Spares						335
						<u>24,807</u>
GRAND TOTAL						\$178,539

Installation Data: Installation will be accomplished by a contractor drive-in mod line.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: OV-10D Service Life Extension (OSIP 42-35)

Models of Aircraft Affected: OV-10D

Description/Justification:

The FLIR and laser designator equipped OV-10D has proven extremely valuable to the Fleet Marine Force. Airframe structural service life of the OV-10D is presently projected to expire in the 1980's without a replacement procurement program to satisfy the operational mission requirement. Additionally, the end of the economic service life is rapidly approaching. The advances in systems state-of-the-art and the consequent changes in the industrial base have lead to significant increases in operating costs. This program will extend the life of the aircraft and make it an effective mission asset into the late 1990's.

Development Status: Several elements of the airframe are known to be a problem and are currently requiring many manhours for inspection and repair or are reducing the operational capability of the aircraft. A study at the Naval Air Development Center under the auspices of NAVAIR (AIR-530) defined problem areas and the final scope of the required modifications which will result in a revision to the OV-10A specification.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$7,510	4	\$8,508	9	\$16,173	15	\$32,281		
O&M Install.			(2)	\$625	(4)	\$1,250	(9)	\$2,881		
O&M Factory Trng.				\$320						
APN-6 Spares		\$590		\$327		\$1,617				
GRAND TOTAL										\$39,891

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) Cherry Point.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Correction of Discrepancies Identified during Preliminary Evaluation and Subsequent Flight Test Programs (OSIP 11-84)

Models of Aircraft Affected: F/A-18, TF/A-18

Description/Justification:

Discrepancies found during testing and evaluation can sometimes be incorporated in production aircraft, effective with the physical configuration audit which establishes the product baseline of the aircraft. However, when this cannot be done due to time constraints, retrofit of the changes in already delivered aircraft will require funding through the Aircraft Modification Program. The unacceptable alternative to retrofitting would be multiple configurations in the Fleet, which create maintenance and supply problems, and in many cases the mission capability of the aircraft would be adversely affected.

Differential Leading Edge Flap	
Airframe Mounted Accessory Drive (AMAD) Heat Exchanger	
Main Landing Gear (MLG) Trunnion	
Main Landing Gear (MLG) Brace	
Electromagnetic Interference Protection of Leading Edge Extension Leading Edge Skin	
Sealed Lead Acid Battery	
Negative "G" Fuel System Limitations	
Nose Landing Gear (NLG) Cylinder Lug	
Center Fuselage Fatigue Improvement	
Engine Control Unit	
Turbine Boost Pumps	
Fuel System Modification	
Throttle Sensitivity - AFC	
Throttle Sensitivity - PPC	
Avionics Cockpit Cooling Fan Thermal Protection	
Avionics Cockpit Cooling Fan Thermal Protection (FOD) Protection	
Lateral Control Improvement Foreign Object Damage (FOD) Protection	
Automatic AC BUS Isolation	
Leading Edge Flap "J" Joints Torque	
Horizontal Stabilizer Eef Up	
Stop Modules for Leading Edge Flap	
Air Turbine Starter (ATS) AMAD Design Changes	5-84

OSIP 11-84

Description/Justification (Cont'd):

ALQ-126 Support Assembly  
 Addition of Latching Relay to BRJ-33  
 IRU-52/A Breach Assembly Design Change  
 Fuselage Fuel Transfer Jet Ejector  
 Copper to Steel Rollers on Leading Edge Flap (LEF)  
 Motive Flow Pumps  
 Forward Fuselage Keel Web Reef-Up  
 Speed Brake Hinge Moment Reduction

Development Status: Each change is either undergoing testing or will be tested and validated prior to installation in the F/A-18.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$8,613		\$8,024		\$6,738		\$6,604		\$6,571		\$3,665
O&MN Install.		\$1,014		\$6,252		\$7,808		\$9,943		\$8,523		\$2,231
APN-6 Spares		\$846		\$232		\$843		\$925		\$920		\$513

	FY 1990		TOTAL	
	Qty	Cost	Qty	Cost
APN-5		\$2,802		\$43,017
O&MN Install.		\$1,951		37,722
APN-6 Spares		\$392		4,511
GRAND TOTAL				\$85,250

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) or by Contractor Field Modification Teams, Organizational and Intermediate levels. Installation will occur by order of priority as established from the results of further flight testing and as operational flights are accumulated.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: OMNIBUS Weapons (OSIP 24-86)

Models of Aircraft Affected: F/A-18, Tr/A-18

Description/Justification:

This modification will achieve F/A-18 compatibility with those new or existing, but not previously addressed, weapons which will be available in the USN/USMC Weapons inventory commencing in FY 1985. These include the new weapon requirements of AIM-7M Sparrow Missile, AIM-9M Sidewinder Missile, AGM-84D Harpoon Missile provisions, FMU-139B Fuse, AGM-88 HARM and BLU-80 Enhancement, as well as those existing weapons not previously integrated with the F/A-18 aircraft, i.e., Mines, and fleet Chemical Weapon. Increasing the F/A-18 weapon capability to include these weapons cited, will meet the urgent fleet requirement to maximize F/A-18 effectiveness in "at-sea" and "power-projection ashore" missions.

Development Status: The nonrecurring design effort for this modification effort has been authorized and was funded via BOA commencing August 1982. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	27	\$7,739	50	\$12,899	38	\$10,281	20	\$5,671	(25)	\$372
O&MN Install.			(12)	\$144	(50)	\$774	(38)	\$565		
APN-6 Spares										

-0-



OSIP 24-86

Project Financial Plan (Cont'd):

	<u>FY 1991</u>		<u>FY 1992</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	13	\$3,851			148	\$40,441
O&MN Install.	(10)	\$149	(13)	\$156		2,160
APN-6 Spares						-0-
GRAND TOTAL						\$42,601

Installation Data: Retrofit will be accomplished during Standard Depot Level Maintenance (SDLM) and Field Mod Team (FMT) at the Naval Air Rework Facility (NARF) North Island with effectivity aircraft F37-145 and TF 10-24.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-126B Provisions (OSIP 46-86)

Models of Aircraft Affected: F/A-18, TF/A-18

Description/Justification:

The AN/ALQ-126B is an improved version of the AN/ALQ-126A Electronic Countermeasures Set. Retrofit modifications will include changes to make the AN/ALQ-126B compatible with the on-board avionics. Significant enhancement over the AN/ALQ-126A will be realized by incorporated/expanded techniques and software processing enabling the ALQ-126B to communicate with the ALR-67. Operational flexibility will be achieved by this change because the aircraft will be able to accommodate either the ALO-126A which is presently in inventory but not in sufficient quantities to fulfill F/A-18 fleet requirements, or use of the ALQ-126B. Aircraft modifications required to retrofit the ALQ-126B are limited to tunable filter and software. Waveguide alteration is not required.

Development Status: The AN/ALQ-126B has completed OPEVAL, and approval for limited production (ALP) was granted in August 1982. Approval for full production (AFP) is planned for the last quarter FY 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	36	\$2,236	160	\$3,546	92	\$2,138	87	\$2,119			375	\$10,039
O&MN Install.			(100)	\$194	(155)	\$301	(88)	\$171	(32)	\$63		729
APN-6 Spares		\$324		\$496		\$299						1,119
GRAND TOTAL												\$11,887

Installation Data: Retrofit will be accomplished at Naval Air Rework Facility (NARF) North Island, during Standard Depot Level Maintenance (SDLM) or by field mod team (FMT) with effectivity aircraft numbers F/A 37-380 and TF/A 10-41.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: H-46 Safety, Reliability and Maintainability (S,R&M) Update (OSIP 31-81)

Models of Aircraft Affected: CH/UH/HH-46

Description/Justification:

H-46 service life extension to at least the mid-1990's is realistic in view of the status of current planning for a replacement aircraft and present budgetary outlook. This extension of operating life makes corrective action on existing major material deficiencies inherent to the aging H-46 fleet imperative if unacceptable impact on safety, fleet readiness and cost of continued ownership is to be avoided.

Planned items involve changes to ensure adequacy of the basic airframe structure and its integral components and to improve reliability and maintainability of various system components. A detailed analysis of the changes indicates their incorporation will significantly improve safety, aircraft availability (+9.6 percent) and maintenance hours per flight hour (MH/FH - 1.91).

Development Status: No development is necessary but qualification testing of affected parts/components is required. Contractor installation and flight test was conducted and followed by Navy evaluation which commenced in June 1984 at the Naval Air Test Center (NATC), Patuxent River, Maryland.

Project Financial Plan:

	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$28,486	3	\$19,301	(2)	\$24,589	85	\$94,045	94	\$106,823
O&MN Install.					(2)	\$2,048	(2)	\$5,871	(3)	\$5,292
APN-6 Spares		\$968		\$2,673				\$28,857		\$28,727

OSIP 31-R1

Project Financial Plan (Cont'd):

	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	116	\$115,492	59	\$60,479					358	\$458,215
O&MN Install.	(72)	\$33,532	(114)	\$50,165	(122)	\$49,191	(43)	\$14,672		160,771
APN-6 Spares		\$31,460								92,685
GRAND TOTAL										\$711,671

Installation Data: To be incorporated during Standard Depot Level Maintenance (SDLM) at Naval Air Rework Facility (NARF) Cherry Point and Naval Air Rework Facility (NARF) North Island.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Night Vision Goggles (OSIP 66-82)

Models of Aircraft Affected: CH-46E

Description/Justification:

The present and projected threat require low altitude helicopter operations which cannot now be conducted at night due to a lack of adequate night vision equipment. AN/AVS-6, third generation aviation night vision goggles, with appropriate cockpit lighting modifications for compatibility, will provide an increased operational capability for the flight crew to perform night time nap of the earth and contour flying in conditions of reduced illumination down to overcast starlight.

Development Status: The Helicopter Night Vision System is being developed under RDT&E, N Program Element Number 642113N. The goggles have been developed by the U.S. Army and are referred to as Aviator's Night Vision Imaging System (ANVIS) or AVS-6. USN approval for full production (APP) is expected by the third quarter FY 1985. Army production was authorized in September 1982. Quick Fix lighting modification for AVS-6 compatibility has been developed by the Naval Air Test Center (NATC) and kits are being manufactured by NAC for the CH-46E. Full lighting modification is being procured through an ECP. The full lighting modification will be installed in 262 CH-46E aircraft.

Project Financial Plan:

		FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (Quick/Full)	8/0		\$1,404	88/0	\$5,210	122/6	\$3,182	0/72	\$7,425	0/79	\$4,010	0/83	\$10,536
O&MN Install.								(6)	\$35	(70)	\$386	(69)	\$370
O&MNR Install.										(2)	\$11	(10)	\$54
O&MN Training			\$80										
Trainer Install.													
APN-6 Spares							\$621		\$743		\$10		\$266

OSIP 66-82

Project Financial Plan (Cont'd):

	FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5					218/262	\$32,668
O&MN Install.	0/22	\$301		\$107		1,290
O&MNR Install.	(73)	\$392	(20)	\$11		130
O&MN Training	(10)	\$54	(2)			80
Traîner Install.						20
APN-6 Spares						1,630
GRAND TOTAL						\$35,818

Installation Data: Quick Fix Lighting Mod kits will be installed at the organizational level by squadron maintenance personnel. Full Lighting Mod kits will be installed at the depot level during Standard Depot Level Maintenance (SDLM) or by field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Engine Air Particle Separators (OSIP 42-83)

Models of Aircraft , ected: CH-46E

Description/Justification:

The CH-46E (reworked from CH-46D/F's) are equipped with either: (a) nonseparating inlet and barrier screen or (b) the engine air particle separators (EAPS). This program replaces the barrier screens. The EAPS is a flight proven erosion protection system with low power loss. The barrier screens impose high power loss, low R&M, and have no anti/de-ice capability. Therefore EAPS are needed as a near term solution to the foreign object damage (FOD) problem and either a redesigned inlet system utilizing the present EAPS or a Heated EAPS (HEAPS) is required for a long term, all weather capability.

Development Status: This system is qualified and flying on H-46 aircraft.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$1,954	20	\$4,644	21	\$4,737	34	\$8,087	52	\$12,999
O&MN Install.					(5)	\$148	(20)	\$592	(41)	\$1,214
APN-6 Spares		\$27						-0-		

OSIP '2-83

Project Financial Plan (Cont'd):

	<u>FY 1988</u>		<u>FY 1989</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5						
O&M Install.	(33)	\$977	(22)	\$680	127	\$32,421
O&MNR Install.	(2)	\$59	(3)	\$89		3,611
APN-5 Spares						148
						<u>27</u>
GRAND TOTAL						\$36,207

Installation will be accomplished by the Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM).



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Improvements to Engine Condition Control System (OSIP 45-85)

Models of Aircraft Affected: CH/UH/H1H-45

Description/Justification:

This program is a safety of flight item. This aircraft improvement program will incorporate new engine conditions actuators (separate actuators for H-46 A/D and for CH-46E) with an associated wiring change and modification to the engine condition control box (common changes for H-46 A/D and for CH-46E). From July 1973 to Nov 1978, there were 94 mishaps attributable to the engine condition actuator and 37 mishaps attributable to the engine condition control box. In addition from the fleet failure summary report covering the period between July 1981 to June 1982, there were 154 failures of the engine condition actuators (56 failures per 1,000 flight hours) on the H-46 A/D and 144 failures (49 failures/1,000 flight hours) for the CH-46E.

Development Status: Studies and analysis of the engine condition control system have been performed. Approval for full production (AFP) is not required.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$1	172	\$2,353	184	\$2,546	353	\$6,023		
06MN Install.					(80)	\$175	(86)	\$188		363
06MNR Install.					(6)	\$13	(6)	\$13		26
06MN Install. (I Level)					(84)	-0-	(96)	-0-		29
06MN Training				\$29						422
APN-6 Spares				\$194		\$228				
GRAND TOTAL										\$6,863

Installation Data: The kits can be installed by Intermediate Maintenance Activity (IMA) Level or higher. Installation evenly split between IMA and Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Navigation and Night/IMC SAR Capability (OSIP 132-85)

Models of Aircraft Affected: CH/UH/HH-46

Description/Justification:

The system will consist of an AN/APN-217 Doppler Radar, and a separate Control Display Unit (CDU) to convert velocity information to navigation and steering information. The AN/APN-217 Doppler Radar is a light weight unit, approved GFE, and selected for use on the SH-60B, MH-53 and AH-1J/T aircraft. The Receiver-Transmitter-Antenna (RTA) transmits a very low power signal which is reflected by the earth's surface and received by the antenna, shifted in frequency directly proportional to the aircraft velocity. The RTA processes the received signal and provides a digital stream of velocity information to the CDU. The velocity information is processed by the CDU to provide a wide variety of navigation and steering information. A separate coupler will be provided for integration with the on-board Automatic Flight Control System (AFCS) to provide for automatic coupled approach to hover. A small analog Steering/Hover Indicator Unit (SHIU) will also be provided with the system for display of easily recognizable steering/hover information within the pilot's primary instrument scan area.

The navigation system will enable the H-46 aircraft to significantly improve mission performance by having a completely self-contained navigation capability, both over land and water, which presently does not exist on these aircraft. Position and steering information will be available in both latitude/longitude and Universal Transverse Mercator (UTM). The alpha/numeric display of the CDU will provide concise, easily understood information readily useable by the flight crew. Additionally, the integration with the AFCS/coupler system will enable the aircraft to have a secondary night/IMC overwater SAR mission capability compliant with the requirements of NWP-42. All basic logistical support elements (technical manuals, provisioning, support equipment, etc.) for the AN/APN-217 are either being procured or planned for procurement under other on-going programs.

Development Status: Approval for Full Production (AFP) on the AN/APN-217 Doppler Radar was received in the second quarter of FY 1985. Provisions will be installed in all 357 aircraft, but only 119 avionics suites are planned for procurement at this time.

Project Financial Plan:

Installation Data: To be incorporated during Standard Depot Level Maintenance (SDLM) at Naval Air Rework Facility (NARF) Cherry Point and NARF North Island.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: H-46 Emergency Flotation System (OSIP 47-86)

Models of Aircraft Affected: CH/UH/HH-45

Description/Justification:

H-46 emergency water landings at sea frequently result in water entry, rollover, and sinking in less than two minutes with loss of the helicopter and occupants. If the aircraft had remained afloat and upright longer, accident statistics indicate 64 lives and 16 aircraft could have been saved. The planned flotation system would permit the H-46 to remain afloat in an upright position for 3 hours and under sea state conditions up to 5 hours. This system consists of four dual compartment polyurethane flotation bags stowed external to the fuselage and inflated in an emergency either manually by the pilot or automatically upon water entry. The inflation medium (nitrogen) will be stored in four 3,000 PSI Kevlar filament-wound pressure vessels.

Development Status: This system is under development by the Naval Air Development Center (NADC), Warminster (RDT&E,N Program Element Number 64213N). RDT&E,N category 6.4 funds have been directed to demonstrate the system in the H-46 and to provide necessary documentation to expedite the production/deployment phase. TECHEVAL (DT-IIB) is scheduled to commence in April/May 1985; OPEVAL (OT-IIC) in June/July 1985; and Approval for Full Production (AFP) is planned for November 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	28	\$3,264	28	\$2,768	110	\$10,574	158	\$15,857
O&M Install.	(1)	\$26	(27)	\$280	(22)	\$228	(100)	\$1,035
O&MNR Install.					(6)	\$62	(10)	\$103
APN-6 Spares		\$236		\$161		\$535		

OSIP 47-86

Project Financial Plan (Cont'd):

	<u>FY 1990</u>		<u>FY 1991</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5						
O&MN Install.	(100)	\$1,035	(48)	\$497	324	\$32,463
O&MNR Install.	(10)	\$103				3,101
APN-6 Spares						268
						<u>932</u>
GRAND TOTAL						\$36,764

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) during Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-157(V) IR Jammer (OSIP 69-79,

Models of Aircraft Affected: CH-53A/D

Description/Justification:

The ALQ-157(V) is an infrared jammer that degrades the capabilities of IR homing missiles posing serious threats to tactical helicopters. Current defenses against IR homing missiles (flare decoys and evasive maneuvers) depend on visual detection of the attack. No warning receiver is available. The ALQ-157(V) provides continuous protection. The equipment consists of two externally mounted transmitter units, an internally mounted electronic control unit, and a pilot's control-indicator. This is a joint Army-Navy program for heavy helicopters with the Navy acting as lead service. The basic jammer or a variant will be applicable to USMC CH-46E, CH-53A/D and to Army CH-47C helicopters. The ALQ-157(V) is being manufactured by Loral Electro-Optical Systems, Pasadena, California.

Development Status: Competitive testing of three EDM's was completed in late FY 1977 with two of the equipments considered capable of meeting the requirements, with improvements to be incorporated in production. Further tests/analysis leading to specifications for production test articles accommodating requirements of all candidate helicopters were completed in FY 1978. In August 1979, a contract was awarded to Loral Electro-Optical Systems for production of twelve system test models for the ALQ-157. Testing leading to approval for full production (AFP) will be completed during the third quarter of FY 1985 and approval for full production (AFP) is scheduled for the fourth quarter 1985.

Project Financial Plan:

	FY 1979		FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$600		\$934	1*	\$199	(1)*	\$946		\$239	55	\$6,879
O&MN Install.								\$8				\$1,154
APN-6 Spares												

\* Prototype.

OSIP 69-79

Project Financial Plan (Cont'd.):

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	50	\$3,408	60	\$4,137			166	\$17,342
O&MN Install.	(48)	\$405	(43)	\$362	(53)	\$447		1,222
O&MNR Install.	(7)	\$59	(7)	\$59	(7)	\$59		177
APN-6 Soares		\$533		\$57				<u>1,744</u>
GRAND TOTAL								\$20,485

Installation Data: Installation will be accomplished by the Naval Air Rework Facility (NARF) Pensacola during Standard Depot Level Maintenance (SDLM) and NARF Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: LTN-211 OMEGA/VLF Navigation Set (OSIP 46-80)

Models of Aircraft Affected: CH-53E, CH-53D, CH-53A, RH-53D

Description/Justification:

The OMEGA navigation set is a long-range over-water navigation system in use on Navy aircraft. The OMEGA system involves the use of eight ground stations located in various parts of the world. The stations emit low frequency radio signals. A receiver/computer aboard the aircraft interprets these signals and computes latitude and longitude of the aircraft. The OMEGA system is also used by commercial airlines. The current standard Navy OMEGA system is the commercial LTN-211. Due to its commercial airline usage, software modification/updates are accomplished at no cost to the government. Commercial repair facilities are worldwide and Mean Time Between Failure (MTBF) in excess of 1500 hours is currently being achieved. This modification installation also provides for a true airspeed system (TAS) to provide velocity information for the OMEGA navigation set. Production CH-53E incorporation is planned for Lot 9 (FY 86).

Development Status: The LTN-211 OMEGA/VLF is approved for full production.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	6	\$331	23	\$2,862	96	\$7,195	57	\$4,081	54	\$3,870	37	\$2,781
O&MN Install.	(6)	\$68			(23)	\$319	(86)	\$1,161	(46)	\$621	(54)	\$729
O&MTR Install.							(10)	\$135	(11)	\$149		
O&MN Training				\$255		\$50						
APN-6 Spares		\$69		\$26		\$285		-0-				



OSIP 46-80

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(37) \$392	273 \$21,120
O&MNR Install.		3,290
O&MN Training		284
APN-6 Spares		305
		<u>380</u>
GRAND TOTAL		\$25,379

Installation Data: Installation will be accomplished by Naval Air Rework Facility (NARF) field team and during Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Night Vision Goggles (OSIP 67-82)

Models of Aircraft Affected: CH-53A/D, RH-53D, CH-53E, MH-53E

Description/Justification:

The present and projected threat requires low altitude helicopter operations which cannot now be conducted at night due to a lack of adequate night vision equipment. The third generation Aviation Night Vision Goggles, with appropriate cockpit lighting modifications for compatibility, will provide increased capability for the flight crew to perform nap of the earth and contour flying at night time in conditions of reduced illumination down to overcast starlight. Production M/CH-53E incorporation is planned for Lot 10 (FY 87).

Development Status: The Helicopter Night Vision System is being developed under RDT&E, N Program Element Number 64213N. The goggles have been developed by the U.S. Army and are referred to as Aviator's Night Vision Imaging Systems (ANVIS) or AVS-6. U.S. Navy Approval for Full Production (AFP) is expected by the third quarter 1985. Army production was authorized in September 1982. Quick fix lighting modification for AVS-6 has been developed by the Naval Air Test Center (NATC) and kits are being manufactured by NAC for the H-53. The Quick Fix lighting modification will be installed in 138 CH-53A/D aircraft, 47 RH-53D aircraft and 18 CH-53E aircraft. The Permanent lighting modification will be installed in 138 CH-53A/D aircraft, 23 RH-53D aircraft and 136 C/MH-53E aircraft.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (Quick/Full)	3/0	\$658	53/0	\$2,143	147/0	\$1,709	0/3	\$14,337	0/76	\$13,904
O&MN Install.							(3)	\$67	(38)	\$857
O&MN Training		\$40								
APN-6 Spares								\$1,305		\$443

OSIP 67-82

Project Financial Plan (Cont'd):

		FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (Quick/Full)	0/99		\$10,725	0/96	\$6,558	0/40	\$3,167	0/13	\$1,079	207/327	\$54,280
O&MN Install.	(75)		\$1,692	(91)	\$2,053	(64)	\$1,444	(56)	\$2,808		8,921
O&MN Training											40
APN-6 Spares			\$643		\$302						2,994
GRAND TOTAL											\$66,235

Installation Data: Lighting Mod kits (Quick Fix) will be installed at the organizational level by Squadron maintenance personnel. Lighting Mod kits (Permanent) will be installed at the depot level during Standard Depot Level Maintenance (SDLM) or by field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Crashworthy Armored Pilot Seats (OSIP 43-83)

Models of Aircraft Affected: CH-53A, CH-53D, RH-53D

Description/Justification:

Personnel currently survive helicopter crashes only when the crash impact is light and the structural integrity of the sea /restraint system is not compromised. The proposed armored seats will provide improved helicopter crash survivability consistent with direction of the Chief of Naval Operations. Early incorporation of impact protection to meet the dynamic requirements based on USAAVLABS Technical Report 70-22 will save a substantial number of lives currently being lost in helicopter mishaps.

Development Status: Crashworthy crew seats have been tested and approved for full production under the CH-46E CILOP. In addition, crashworthy crew seats are being installed in the U.S. Army Black Hawk and U.S. Navy derivative Sea Hawk.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	?	\$1,881	38	\$3,301	51	\$4,820	28	\$2,779	37	\$5,875
O&MN Install.			(2)	\$2	(34)	\$26	(47)	\$36	(22)	\$17
O&MN Install.					(4)	\$3	(4)	\$3	(6)	\$5
O&MN Factory Training		\$180		\$100						
APN-6 Spares				\$163						
										-0-

OSIP 43-83

Project Financial Plan Cont'd:

	<u>FY 1988</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5				
O&MN Install.	(32)	\$25	155	\$16,656
O&MNR Install.	(5)	\$4		106
O&MN Factory Training				15
APN-6 Spares				100
				<u>343</u>
GRAND TOTAL				\$17,220

1 Kit = 2 seats w/identical armor.

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) and NARF Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Crashworthy Fuel System (OSIP 65-84)

Models of Aircraft Affected: CH-53A, CH-53D, RH-53D

Description/Justification:

The crashworthy fuel system is designed to contain fuel spillage during and following a crash or impact with the ground. The system consists of impact resistant fuel tanks and flangeable fittings which resist fracture during crash impacts. The system will also incorporate an increase in ballistic protection for the fuel tanks.

Development Status: A crashworthy fuel system has been developed for the CH-53E currently in production. Major segments of the CH-53E system will be interchangeable with the CH-53A/D and RH-53D aircraft and will only require verification. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$6,633	55	\$4,518	45	\$3,362	58	\$4,498	21	\$1,708
O&M Install.			(3)	\$36	(48)	\$578	(38)	\$458	(51)	\$614
O&MNR Install.					(7)	\$84	(7)	\$84	(7)	\$84
APN-6 Spares				\$243		\$149		\$157		

OSIP 65-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>TOTAL</u>	<u>Cost</u>
APN-5						
O&MN -install.	(21)		\$253	182	\$20,719	
O&MNR Install.					1,939	
APN-6 Spares					252	
					<u>549</u>	
GRAND TOTAL						\$22,459

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) and NARF Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Aircraft Survivability Improvement (OSIP 133-85)

Models of Aircraft Affected: CH-53A, CH-53D, RH-53D, CH-53E, MH-53E

Description/Justification:

Incorporation of composite material flight control rods will withstand ballistic threats up to 12.7 mm on all H-53 series helicopters. A total of 39 flight control system control rods will be replaced with the new material. In addition, a survivable tail rotor quadrant based on the contractor's design for the H-60 helicopter will be installed on all series H-53 helicopters except the CH-53E which does not require the change. Ballistic protection will be provided to allow full yaw control of ballistic impacts resulting in severance of either one of the tail rotor cables. Production CH-53E incorporation is planned for Lot 10 (FY 87). The CH-53E is planned to have a Nitrogen Gas Inerting System which will reduce the risk of fire damage.

Development Status: A survivable tail rotor quadrant system has been developed by the contractor and is currently used on the UH-60A Black Hawk Helicopter. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	3	\$3,352	20	\$2,656	48	\$6,543	74	\$10,577	82	\$12,435
O&MN Install.	(1)	\$51	(3)	\$145	20	\$980	(7)	\$1,975	(66)	\$3,178
O&MNR Install.								\$377	(7)	\$337
APN-6 Spares		\$52		\$145		\$458				



OSIP 133-85

Project Financial Plan (Cont'd):

	FY 1990		TOTAL	
	Qty	Cost	Qty	Cost
APN-5				
O&MN Install.	(76)	\$3,661	228	\$35,563
O&MNR Install.	(7)	\$327		9,990
APN-6 Spares				1,011
				<u>655</u>
GRAND TOTAL				\$47,219

Installation Data: Fuel system protection will be installed during normal Standard Depot Level Maintenance (SDLM) and NARF Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ARC-182(V) VHF-UHF, AM/FM Transceiver (OSIP 2-86)

Models of Aircraft Affected: CH-53A; CH-53D; RH-53D; CH-53E

Description/Justification:

The AN/ARC-182(V) is a solid state VHF/UHF, AM/FM transceiver planned to be installed in a wide variety of tactical aircraft. This state-of-the-art VHF/UHF combination radio will provide VHF-FM (30-88 MHz), VHF-AM (108-156 MHz), and UHF-AM/FM (225-400 MHz) secure voice communications. The AN/ARC-182 will replace existing VHF-AM/FM and UHF-FM radios currently installed in the H-53 helicopters. Production CH-53E incorporation is planned for Lot 8 (FY 85).

Development Status: Operational Evaluation (OPEVAL) for the AN/ARC-182 has been completed. FOT&E is currently underway and should be completed by the second quarter FY 1985. Approval for full production (AFP) is anticipated in the third quarter of FY 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	6	\$3,046	87	\$7,856	87	\$7,498	72	\$6,504	(05)	\$313	252	\$24,904
O&MN Install.			(3*)	\$17	(80)	\$385	(80)	\$385	(05)	\$313		1,100
O&MNR Install.					(7)	\$34	(7)	\$34	(7)	\$34		102
O&MN Training				\$183								183
APN-6 Spares		\$73		\$51		\$54						178
GRAND TOTAL												\$26,467

\* 3 Kits installed by contractor during validation

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) and NARF Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Four Axis Stick Desensitizer (OSIP 49-86)

Models of Aircraft Affected: CH-53E

Description/Justification:

Flight tests and analyses by Sikorsky have shown that there is a serious interaction between the airframe dynamics and the flight control system. Airframe oscillations are fed back into the control system through the rate gyros or the pilot's controls. Rapid pilot inputs through the cyclic collective or rudder pedals in the stick desensitizers mode response that can be catastrophic if not properly handled. Incorporation of electronic filtering "stick desensitizers" in command and feedback paths effectively eliminates this coupling. Pilot inputs in the low frequency range are unaffected, but the higher frequency components that trigger the adverse response are filtered out. Production CH-53E incorporation is planned for Lot 9 (FY 86).

Development Status: "Desensitizers" are being incorporated in all CH-53E aircraft; however, these devices are simplex, i.e., a single failure, in either the sensor or computer, renders the protection inoperative. This OSIP introduces hardware and software which makes the desensitizers "fail operational" and no longer subject to single point failures. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	19	\$2,328	20	\$1,357	20	\$1,425	20	\$1,493	20	\$1,565
O&MN Install.					(19)	\$475	(20)	\$500	(20)	\$500
O&MN Training				\$150						
APN-6 Spares		\$234		\$258		\$271				

OSR. 49-86

Project Financial Plan (Cont'd):

	FY 1991		FY 1992		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	(20)	\$500	(20)	\$500	99	\$ 8,168
O&MN Install.						2,475
O&MN Training						150
APN-6 Spares						<u>763</u>
GRAND TOTAL						\$11,556

Installation Data: Installation will be performed by contractor field team at government site.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: APR-44 (OSIP 24-82)

Models of Aircraft Affected: UH-1N

Description/Justification:

The APR-44 is an Army developed continuous wave (CW) warning receiver intended for use on helicopters. Total installed weight is approximately 4 pounds, size is 33 cubic inches. The system is required by Marine Corps assault helicopters that currently have no CW warning system. Provisions and APR-44s will be installed in 139 UH-1Ns.

Development Status: Development by the U.S. Army was completed in FY 1979. Army production began in FY 1980 and is continuing. Approval for full production (AFP) was received in October 1984.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
O&MN Install.		\$140		\$158		\$103	2	\$464	67	\$3,257	70	\$2,170
APN-6 Spares								\$42	(2)	\$25	(67)	\$827
										\$207		\$49
APN-5												
O&MN Install.												
APN-6 Spares	(70)	\$864	139	\$6,289								
				1,758								
				256								
GRAND TOTAL												

Installation Data: Installation will be accomplished by contractor field team on site at Marine Corps facilities on East and West Coasts.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Night Vision (OSIP 68-82)

Models of Aircraft Affected: UH-1N

Description/Justification:

In order to improve UH-1N aircraft effectiveness, it must have the capability to operate at low altitude at night. An improved cockpit lighting system must be integrated with night vision goggles to meet fly and fight at night operational requirements.

Development Status: R&D efforts were conducted by the U.S. Army for night vision capability. Approval for Full Production (APP) on the night vision goggles is scheduled for the third quarter FY 1985. This modification will be installed on 139 UH-1N aircraft.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
Quick Fix	2	\$351	14	\$1,466	83	\$545		\$6,237	68	\$5,659	69	\$4,472
Full AVS-6					2	\$214		\$448		\$234	(68)	\$15,951
O&MN Install.							(2)	\$224				
O&MN Factory Training		\$40										
APN-6 Spares						\$56		\$303		\$207		

OSIP 68-82

Project Financial Plan (Cont'd):

	FY 1988		TOTAL	
	Qty	Cost	Qty	Cost
APN-5				
Quick Fix	29			\$ 2,462
Full AVS-6	139			16,582
O&MN Install.	(60)	\$16,187		32,820
O&MN Factory Training				264
APN-6 Spares				<u>566</u>
				\$52,694

Installation Data: Quick fix kits will be installed at the organizational level by squadron maintenance personnel. Full cockpit mod kits will be installed at the contractor's plant.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Night Vision (OSIP 69-82)

Models of Aircraft Affected: AH-1T/J

Description/Justification:

In order to improve AH-1T/J aircraft effectiveness, it must have the capability to operate at low altitude at night. An improved lighting cockpit system must be integrated with night vision goggles to meet fly and fight at night operational requirements.

Development Status: An R&D effort was conducted by the U.S. Army for night vision capability. Approval for full production (AFF) on the night vision goggles is scheduled for the third quarter FY 1985. This modification will be installed on 58 AH-1J and 94 AH-1T aircraft.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 - AVS-6										
Quick Fix		\$343	20	\$1,947	26	\$5,018		\$5,931	(2)	\$2,555
Full					2	\$375				\$858
O&MN Install.								\$351		
O&MN Training		\$40				\$167		\$322		\$109
APN-6 Spares										



OSIP 60-82

Project Financial Plan (Cont'd):

	<u>FY 1987</u>		<u>FY 1988</u>		<u>FY 1989</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5 - AVS-6								
Quick Fix							58	\$ 7,308
Full							94	17,609
O&MN Install.	48	\$4,656	44	\$4,048				
O&MN Training			(48)	\$11,814	(44)	\$10,829		23,501
APN-6 Spares								391
								598
GRAND TOTAL								\$49,407

Installation Data: AVS-6 quick fix kits will be installed at the organizational level by squadron maintenance personnel. Full cockpit mod kit procurement will begin in FY 1984 and will be installed at the contractor's plant.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation. APN - Activity 5

Modification Title and No. HELLFIRE Weapon System (OSIP 20-84)

Models of Aircraft Affected: AH-1J/T

Description/Justification:

The HELLFIRE anti-tank weapon system is being developed by the Army for use on the AAH-64. The Navy/Marine Corps are participating in a Joint Development Program. R&D funding is available in FY 1982-1985 for this development. This program will provide for retrofit of the HELLFIRE Missile System into the AH-1J and AH-1T Marine attack helicopters starting in FY 1984. The AH-1J interface/integration will add a new capability. The AH-1T interface/integration will provide HELLFIRE missile system and TOW Missile System capability for greater operational flexibility.

Approval for full production (AFP) is complete. The HELLFIRE weapon system development by the Army is complete. Approval for full production (AFP) is scheduled for the third quarter of FY 1985 for the AH-1J and FY 1986 for AH-1T.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$1,547	27	\$8,600	22	\$12,876	26	\$15,665	21	\$11,340
O&MN Install.			(2)	\$231	(27)	\$2,854	(22)	\$2,299	(26)	\$2,717
O&MN Training		\$535		\$598						
APN-6 Spares				\$1,092		\$1,206		\$1,725		\$928

OSIP 20-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>TOTAL</u>	
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>	
APN-5		98	\$48,028
O&MN Install.	(21)	\$2,195	10,296
O&MN Training			1,133
APN-6 Spares			<u>4,951</u>
GRAND TOTAL			\$64,408

Installation Data: Installation will be accomplished by contractor field team on site at East and West coast Marine Corps facilities.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Automatic Hover Coupler (OSIP 156-84)

Models of Aircraft Affected: UH-1N

Description/Justification:

Navy UH-1N Helicopters being used for Search and Rescue (SAR) work currently are being restricted to daylight operations or night operations only when a horizon can be seen. The SAR helicopter must be updated with a system that will allow night operations under all conditions.

An interface will be imbedded within the AN/APN-217 for integration with the onboard Automatic Flight Control System (AFCS) to provide for automatic coupled approach to hover. A small analog steering/hover indicator unit will also be provided with the system for display of hover information within the pilots primary instrument scan area.

Development Status: The AN/APN-217 Doppler Navigation System, a hover coupler computer, and additional sensor instrumentation will be added to UH-1N aircraft configured with an existing Automatic Flight Control System (AFCS). The entire system will provide hands-off approach-to-hover capability. The integration and qualification of the Doppler Navigation System, the Hover Coupler and the AFCS will require a qualification program. Approval for Full Production (AFP) on the AN/APN-217 was received in the second quarter of FY 1985. The Hover Coupler computer will be qualified by similarity to the U.S. Army OH-58 AFCS System.

OSIP 156-84

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$4,839	(1)	\$10	8	\$9,049	15	\$5,124	(15)	\$158	24	\$19,012
O&MN Install.				\$10			(8)	\$19				187
O&MN Training				\$10		\$210		\$278				220
APN-6 Spares						\$1,124						1,402
GRAND TOTAL												\$20,821

Installation Data: Kjt installation will be by contractor field team at East Coast, West Coast and overseas facilities.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Navigation System (OSIP 96-85)

Models of Aircraft Affected: AH-1J and AH-1T

Description/Justification:

Several operational requirements including the requirement to operate at low altitudes and at night dictate the need for a navigation system. The system will consist of the AN/APN-217 doppler navigation system plus associated cockpit instrumentation.

Development Status: Approval for Full Production (APF) on the AN/APN-217 was received the second quarter FY 1985.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5										
O&MN Install.		\$500	2	\$2,556	30	\$10,266	20	\$6,688	27	\$9,601
APN-6 Spares				\$411	(2)	\$105	(30)	\$3,150	(20)	\$2,100
						\$142		\$205		

	FY 1990		FY 1991		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5						
O&MN Install.	15	\$5,590	94	\$35,201		
O&MNR Install.	(27)	\$2,875	(3)	\$115		
APN-6 Spares			(12)	\$1,260		
				758		
GRAND TOTAL				\$45,724		

Installation Data: Installation will be by contractor field team.

5-125

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Tail Pylon/Drive Train Improvements (OSIP 149-83)

Models of Aircraft Affected: SH-2F, HH-2D, NHH-2D

Description/Justification:

The present aluminum pylon, aluminum/fiberglass horizontal stabilizer, and power train evolved from the original UH-2 A/B single-engine helicopter via add-on/beef-up modification. With growth of the H-2, changing loads and vibratory conditions have led to fatigue failures in the tail rotor gear box, corrosion in the attachment shaft of the horizontal stabilizer and wear and corrosion in the flapping and pitch bearings. This program will eliminate the 50-hour inspection requirement for fatigue cracks in the tail rotor gear box attachment lugs. The redesign of the housing and the use of stronger aluminum to replace the present magnesium will provide greater fatigue and corrosion resistance. A new forged aluminum tail rotor gearbox mounting, rib will also be installed to provide a fatigue resistant structure. The changes to the flapping and pitch bearings will extend the scheduled maintenance time from 5 hours to an expected 15 to 20 hours and prevent binding in the tail rotor controls. The redesign of the horizontal stabilizer mount and associated isolator bearings will alleviate the sticking in the stabilizer. Two aircraft losses (September 1982 and September 1983) have been attributed to tail rotor drive train failures. The redesign of this system will provide an adequate safety margin and prevent future failures of this type.

OSIP 149-83 is divided into five kits:

Kit A - Horizontal stabilizer attachment redesign.

Kit B - Redesign of the flapping and pitch bearings.

Kit C - Redesign aluminum tail rotor gearbox and forged aluminum tail rotor gearbox mounting rib.

Kit D - Minor Main Gearbox Improvements.

Kit E - Drive Train Improvements.

The OSIP is subdivided into separate elements because although the overall objective of the efforts are interrelated, each element can be developed separately.



OSIP 143-82

Description/Justification (Cont'd):

The main gearbox improvements included in the program are a result of the ongoing SH-2F Readiness Improvement R&D program (PE 64219N). Minor changes can be incorporated in the main gearbox now, giving an immediate increase in R&M. These include improved main rotor shaft lower oil seal, improved tail rotor drive output shaft and forward bearing lubrication. The remaining long term main gearbox improvements are covered under OSIP 21-86.

Development Status: Kit A - Horizontal Stabilizer testing was completed February 1984. Kit B - Fatigue testing and whirl testing was completed April 1984. Kit C - Fatigue testing was completed March 1984. Kit D - Bench tests and Flight Evaluations were completed October 1983. Kit E - Flight testing will be completed by December 1986. Approval for Full Production (AFP) is not required for any kit.

Project Financial Plan:

	<u>FY 1983</u>		<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>		<u>FY 1988</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	52	\$219	144	\$1,982	183	\$3,675	273	\$8,121	174	\$5,506	44	\$6,136
O&MN Install.**						\$226		\$259		\$331		\$310
APN-6 Spares		\$67		\$464		\$1,313		\$2,395		\$4,195		\$3,150
APN-5	49	\$7,162			919*	\$32,801						
O&MN Install.**		\$521		\$182		1,829						
APN-6 Spares						11,584						
GRAND TOTAL												\$46,214

\* Quantity represents kits vice aircraft.

\*\* Costs include installation kits and spares kits.

Installation Data: The modification kits will be incorporated during component rework Standard Depot Level Maintenance (SDLM) and by Field Mod Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: DC Fuel Quantity System and 100-Gallon Auxiliary Tanks (OSIP 72-84)

Models of Aircraft Affected: SH-2F, HH-2D, NHH-2D

Description/Justification:

The fuel quantity system presently used is an AC system with moisture-sensitive shielded cables from the tank units to the bridge amplifier. The tank units are sensitive to water-saturated fuel, which also affects amplifier adjustments. The quantity unit itself experiences binding and internal failures. These problems lead to erroneous indication of fuel quantity remaining in one or more fuel tanks. Current Navy Maintenance Support Office (NAMSO) data indicates that approximately 190 maintenance actions per month are being documented consuming over 850 maintenance manhours per month to correct fuel quantity system discrepancies. The present SH-2F equipped with a 60-gallon auxiliary tank and one MK 46 torpedo has 1.4 hours time on station at 35NM combat radius for the ASW mission; when two 60-gallon tanks are carried on station, time is approximately 2.0 hours. This relatively short time on station inhibits the operational capability of the total LAMPS MK I as an effective ASW system.

A replacement system utilizing state-of-the-art DC circuitry and 100-gallon auxiliary tanks is recommended. All components of the AC system will be replaced with DC units connected with conventional unshielded wiring. The indicator will use a DC motor thus eliminating the need for gearing which is a high failure component in the present system. The maximum take-off weight will be increased to 13,500 pounds to take full advantage of the 100-gallon auxiliary tank which will increase on station time at 35 NM to 1.9 hours with one tank or 2.6 hours with two tanks. The SH-2F has been demonstrated by Kaman pilots at 13,500 pounds gross weight. The limited amount of flight testing required to complete the 13,500 pound qualification program was accomplished under the FY 1982 new buy in August 1984.

Development Status: Flying qualities, structural demonstration, and hard landings have been completed at 13,500 pounds. Static strength tests of the auxiliary tank support structure are complete. Form, fit, function and jettison tests of the auxiliary tanks have been conducted. Prototype testing of fuel quantity system was performed by the Naval Air Test Center in April 1984. Approval for Full Production (AFN) is not required. This change has been approved for FY 1983 production incorporation.

OSI: 72-84

Project Financial Plan:

	<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>		<u>FY 1988</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	27	\$2,444	22	\$1,871	36	\$3,227	26	\$2,069	(36)	\$1,099
O&MN Install.					(24)	\$733	(22)	\$572		
O&MNR Install.					(3)	\$92				
APN-6 Soares		\$625		\$818						
	<u>FY 1989</u>		<u>TOTAL</u>							
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>						
APN-5			111	\$ 9,611						
O&MN Install.	(5)	\$153		2,657						
O&MNR Install.	(21)	\$641		733						
APN-6 Spares				<u>1,443</u>						
GRAND TOTAL				\$14,444						

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ASN-123 Tactical Navigation Set Improvement (OSIP 60-85)

Models of Aircraft Affected: SH-2F, HH-2D

Description/Justification:

The current configured ASN-123 installed in the SH-2F and SH-3H helicopters is memory saturated and unable to accept tactical software changes or additions. The requirements for TACNAV software additions must increase to keep the system tactically current and operationally ready. At the same time, commonality of software between the H-2 and H-3 must remain to keep software costs and numbers of changes to a minimum.

This modification increases the tactical capability of the ASN-123 by the incorporation of hardware improvements to permit greater flexibility in software programming. Memory will increase from 32K to 128K, processor speed (clock speed) will increase, and the capability of processing 15 sonobuoy launch tube signals will be added. The increased memory size will provide critically needed capacity to incorporate 33 outstanding software changes of which 8 are safety and 16 are mission essential.

Included in this change is a memory shield which will eliminate an EM vulnerability.

Development Status: New solid state memory has completed formal qualification testing as part of the EA-6B Digital Display Group installation. Approval for full production (AFP) is not required. This is a joint program between H-2 and H-3 aircraft. A majority of the nonrecurring costs are provided by the SH-2F FY 1982 new production program.

OSIP 60-85

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	50	\$4,000	40	\$3,549			90	\$ 7,549
O&MN Install.			(50)	\$1,193	(40)	\$954		2,147
O&MN Training		\$150						150
APN-6 Spares		\$3,269		\$1,934				5,203
GRAND TOTAL								\$15,049

Installation Data: Contractor installation of AVC retrofit kits will be accomplished the same way as production systems, by contractor component rework program. AFC will be accomplished at organizational level.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Torpedo Depth Control (OSIP 127-85)

Models of Aircraft Affected: SH-2F

Description/Justification:

The primary ASW weapon carried by the SH-2F is the MK-46 ASW torpedo. The operation and initial search depth for the torpedo must currently be selected prior to launch. Proper selection of these two parameters is critical to the success of the attack. An airborne torpedo presetter will enable the aircrew to select/modify the operating mode and initial search depth parameters in real time as tactical information and situation dictate, thereby increasing the probability of a successful attack.

The operational requirement states that positive near and long term impact on ASW readiness which the torpedo presetter represents, warrants maximum support and earliest possible IOC. The SH-2F is the only remaining US airborne ASW platform without this capability. The torpedo presetter incorporates provisions which will be required for future compatibility with the ALWT.

Development Status: The Torpedo presetter to be used by the SH-2F is under development by Naval Avionics Center and is partially funded by NAVSEA. The FY 1985 effort includes design and development for installing AFC kit, validation, verification and test. Approval for full production (AFP) is not required.

OSIP 127-85

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	3	\$1,000	16	\$2,279	46	\$2,957	45	\$3,033			110	\$ 9,269
O&MW Install.			(3)	\$36	(10)	\$120	(34)	\$409			(39)	1,035
O&MW Install							(12)	\$145			(12)	290
O&MN Training				\$261								261
APN-6 Spares				\$1,242		\$1,329		\$574				3,145
GRAND TOTAL												\$14,000

Installation Data: Installation will be accomplished during Standard Depot Level Maintenance (SDLM) and by Field Mod Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Composite Main Rotor Blade (OSIP 20-86)

Models of Aircraft Affected: SH-2F, HH-2D, NHH-2D

Description/Justification:

The composite main rotor blade for the SH-2F is a product of composite material applications, such as the AH-1 improved main rotor blade which is now in production for the Army. Although the new blade is composite construction, it will be completely compatible with the existing SH-2F rotor system and will retain the outstanding flight characteristics that the -101 rotor presently exhibits. Substantial life cycle cost savings will accrue to the Navy due to the elimination of corrosion susceptible materials, the extended fatigue life (approximately the 10,000 hours vice the current 3,000 hour blade), and the improved reliability and outstanding field repairability that is inherent in composite rotor blades. These features have already been demonstrated through an extensive test program and initial field use of AH-1 blades.

Development Status: Engineering and development started in FY 1982 as part of the SH-2F Readiness Improvement Program (RIP). RDT&E, N Program Element Number 64219N refers. Flight testing will commence in February 1985. Navy certification testing will be completed in September 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	14	\$6,805	20	\$7,093	65	\$24,172	12	\$4,706	111	\$42,776
O&M Install. "O" Level		-0-								-0-
O&M Training		\$175								175
APN-6 Spares		\$2,772		\$6,815		\$14,415		\$2,156		26,156
GRAND TOTAL										\$69,109

Installation Data: Installation will be accomplished at the organizational level.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Main Gear Box Improvements (OSIP 21-86)

Models of Aircraft Affected: SH-2F, HH-2D, NHH-2D

Description/Justification:

The improvements to the main gear box will increase the Time Between Overhaul (TBO), reduce overhaul cost, and increase reliability. This will result in less frequent gear box removals and increase operational readiness for the SH-2F. There are five areas where improvements will be made to the gear box: planetary gear reduction system, upper housing/ring gear fasteners, azimuth support spline, and oil filtration.

Development Status: Engineering and development started in FY 1982 as part of the SH-2F Readiness Improvement Program (RIP). RDT&E, N Program and Element Number 64219N refers. Bench testing commenced in January 1984. All testing will be completed in FY 1985.

Project Financial Plan:

	FY 1985		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	58	\$4,356	58	\$4,178	116	\$8,534		
O&MN Install.*			(88)	\$678	(88)	\$678		
O&MN Training		\$42						42
APN-6 Spares		\$2,055		\$2,160				4,215
GRAND TOTAL								\$14,147

Installation Data: Installation of kits in gearboxes will be accomplished during the Component Rework program at NARF Pensacola. \*Total installation includes gearbox for 60 spares.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: SH-3 Service Life Extension (OSIP 46-83)

Models of Aircraft Affected: SH-3H/SH-3G/SH-3D

Description/Justification:

The SH-3 SLEP program will extend the service life of the SH-3 past the year 2000. This program addresses H-3 airframe items that are unreliable or in a severely degraded material condition. Conversion from SH-3D to the SH-3H configuration is also included for the first 26 SH-3D aircraft to undergo SLEP. This modification will include extensive rework of the dynamic components, correction to areas of severe airframe corrosion, installation of a Bifilar Head to reduce dynamic vibrations in the airframe, modified webbing in the aircraft structure to alleviate cracking, rewiring of the aircraft electrical system, and installation of structure and kits for crash attenuating seats. This program is comprised of three kits: Kit A is a basic airframe SLEP kit; Kit B consists of rotor head improvements, bifilar, crash attenuating seats (in the case of crash attenuating seats, only 129 aircraft will be outfitted under this program, the remaining aircraft will be outfitted under OSIP 23-84), ASE Improvements, and incorporation of the ARN-118 TACNAV in SH-3H model only (Common Avionics OSIP will incorporate ARN-118 TACNAV in other H-3 models). Kit B will be incorporated in all H-3 aircraft; kit C contains the hardware required for SLEP and conversion of SH-3D to SH-3H group E configuration.

Development Status: Contractor testing of critical components will be performed on a validation aircraft. Government testing at NATC will be performed to verify flight characteristics. No OT&E required.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$24,262		\$28,914		\$58,813		\$48,585		\$22,614
O&M Install.		\$771		\$783		\$1,746		\$17,720		\$29,725
APN-6 Spares		\$2,958		\$4,210		\$7,866		\$3,653		\$4,253

OSIP 46-83

Project Financial Plan (Cont'd.):

	FY 1988		FY 1989		FY 1990		FY 1991		FY 1992		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$50,146		\$58,009		\$50,587					*	\$341,930
O&MN Install.		\$22,428		\$15,127		\$32,776		\$45,383		\$20,151		186,610
APN-6 Spares		\$4,038		\$737		\$566						28,331
GRAND TOTAL												\$556,871

\* Kit A (98), Kit B (200), Kit C (26). Total quantity of kits is 324.

Installation Data: Installation of Kit A will be accomplished by the winner of a competitive bid. Installation of Kit B will be accomplished during component rework, Standard Depot Level Maintenance (SDLM) or Field Mod Team. Installation of Kit C will be accomplished by the prime contractor.

**MODIFICATION OF AIRCRAFT**  
**FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: VH-3D Cockpit/Avionics Update (OSIP 136-83)

Models of Aircraft Affected: VH-3D

Description/Justification:

The VH-3D helicopter provides world wide executive transportation for the President of the United States, Vice President, Foreign Heads of State and others as directed by the military office of the White House. The capability of the VH-3D to support the White House Emergency Plan (WHEP) in other than VMC conditions is marginal. The VH-3D capability to communicate consists of line-of-sight UHF and VHF radios only. The planned addition of a Presidential communication capability by the White House Communication Agency (WHCA), crypto communication capability, H.F. communication, and additional Secret Service radio communication equipment requires reduction in weight and volume of existing VH-3D aircraft be equipped to prevent a degradation in passenger load or range. Additionally, execution of the WHEP requires the aircraft be equipped with all weather capabilities to include radar and on-board navigation equipment.

Development Status: The Naval Air Development Center (NADC) is currently involved in a study to update the VH-3D avionics systems with the intention of EMP hardening selected sub-systems. Hardware selection was completed in FY 1982. Laboratory facility completion and aircraft installation design was completed in the second quarter FY 1984. Laboratory integration and aircraft configuration was completed in FY 1984; aircraft flight checks will commence in the second quarter of FY 1985.

Project Financial Plan:

	<u>FY 1983</u>		<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5		\$2,000	1	\$8,044	"	\$17,032	3	\$13,543	3	\$13,443
O&MN Install.					(2)	\$1,264	(4)	\$2,389	(4)	\$2,389
O&MN Training				\$250		\$500		\$500		\$500
APV-6 Spares				\$2,500		\$2,212		\$2,347		

OSIP 136-83

Project Financial Plan (Cont'd):

	<u>FY 1988</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(1) \$597	11 \$54,062
O&MN Training		6,639
APN-f Spares		1,750
		<u>7,059</u>
GRAND TOTAL		\$60,510

Installation Data: Installation will be accomplished during normal Special Periodic Aircraft Rework (SPAR).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Main Gear Box Improvements (OSIP 77-84)

Models of Aircraft Affected: SH-3H, SH-3D, VH-3A, HH-3A, SH-3G, UH-3A

Description/Justification:

The H-3 Main Gear Box (MGB), which has a Maximum Operating Time (MOT) of 1800 hours, has a Mean Time Between Failure (MTBF) of only 450 hours. The primary reason for the low MTBF is the premature failure of various subcomponents. A 3-year average shows one-third of early removals are for metal contamination and one-third for Free Wheel Unit (FWU) failures. Catastrophic failures of MGB subcomponents have been suspected causes for the losses of five (5) Navy and two (2) Air Force H-3 Helicopters between 1978 and 1981. Also during that three year period there were 34 additional mishaps which necessitated the premature removal of MGB's and were potential catastrophic failures. This program proposes improvements that will distinctly improve MGB reliability service life and eliminate the present safety of flight hazards responsible for the 41 incidents described. MTBF will improve by 200 percent and Maintenance Manhours will decrease by 25 to 50 percent. Shaft Horsepower (SHP) of the improved MGB will be increased to 2,700 SHP from 2,500 SHP through a qualification/test program to interface with the T58-GE-402 OSIP. Improvements include:

1. Free Wheel Unit Redesign - A new bearing cage design will eliminate roller bearing and cam shaft damage during accessory drive operation, the major cause of FWU damage and failures.
2. Lubrication System Improvements - Improved subcomponent materials, increased capacity lubrication pumps, increased efficiency oil cooling, and dramatically improved filtration will significantly reduce current problems of oil starvation, high-temperature and, most importantly, contamination of oil which can, and does, lead to catastrophic MGB failures.
3. Subcomponent Improvements - A group of critical subcomponents, such as gimbel ring bushings and input pinion gears, which have been shown to cause MGB failures and dramatically effect MGB reliability and service life, are slated for improvement.

Development Status: The development is being funded by the AERMP Program, Program Element Number 25633N, W1041-SL. Approval for full production (AFP) is not required. Preliminary Military Qualification Tests (PMQT) was completed in January 1984.

OSIP 77-84

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
O&MN Install.	80	\$17,946	90	\$19,793	29*	\$11,438					199	\$49,177
O&MNR Install.					(53)	\$2,127	(63)	\$2,529	(29)	\$1,164		5,820
APN-6 Spares		\$7,318		\$11,303	(27)	\$1,084	(27)	\$1,084				2,168
						\$9,628						28,240
GRAND TOTAL												\$65,414

\*Includes 2 kits for Shaft Horsepower (SHP) uprating.

Installation Data: Installation will be accomplished by the contractor during a component turnaround program and by Field Mod Teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: H-3 VHF Comm/NAV Equipment (OSIP 55-85)

Models of Aircraft Affected: SH-3H, SH-3D, UH-3A, SH-3G, HK-3A, VH-3A

Description/Justification:

CNO operational requirement established for helicopter VHF communication and navigation equipment by CNO msg 091737Z March 1982. H-3 communication equipment is inadequate for full range of utility missions because of lack of VHF band comm/NAV capabilities. Aircraft cannot communicate with U.S. or foreign Civil Air Traffic Control agencies or civil towers. During coordinated SAR efforts, H-3's cannot communicate with assisting military or civil ground units or with the U.S. Coast Guard. Three off-the-shelf radios have been identified to correct the above deficiencies. Aircraft assigned overseas direct support require AN/ARC-186 VHF radios (Kit A) and VIR-31H navigation receiver (Kit B). CONUS SAR aircraft require AN/ARC-186 radio (Kit A) and Wulfsberg 7200 radio (Kit C). A three year program will install Kit A and Kit B in 55 H-3's and Kit A and Kit C in 37 H-3's.

Development Status: AN/ARC-186 and the VIR-31H have Approval for Full Production (AFP). AN/ARC-186/H-3 integration is in process and is scheduled for completion in the second quarter of FY 1985. VIR-31H/H-3 integration is scheduled for the third quarter of FY 1985. Wulfsberg 7200 is a commercial radio; approval for limited production (ALP) efforts are in process.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	42	\$1,906	94	\$2,552	48	\$966	(69)	\$1,026	184	\$5,424
O&MN Install.			(21)	\$185	(94)	\$1,246				2,457
O&MN Training				\$157						157
APN-6 Spares		\$10		\$41		\$143				194
GRAND TOTAL										\$8,232

Installation Data: Installation will be accomplished at the depot during Standard Depot Level Maintenance (SDLM) and Field Mod Teams (FMT).



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ASN-123 Tactical Navigation Set Modifications (OSIP 16-86)

Models of Aircraft Affected: SH-3H

Description/Justification:

This modification increases tactical capabilities of the AN/ASN-123 TACNAV System through incorporation of hardware/software improvements. Present TACNAV System is unable to respond to current aircraft mission requirements due to exhaustion of available 32K computer memory. This modification will provide new memory core of 128K and increase computer processing rate.

Development Status: New memory core has completed formal qualification testing as part of the SA-63 Digital Display Group Program. Approval for full production (AFP) is not required. This OSIP is a joint program between H-2 and H-3 aircraft. Funding assumes major portion of nonrecurring funded by H-2 new production.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	37	\$5,615	57	\$5,502	94	\$11,117		
O&MN Install.			(37)	\$81		206		
O&MN Training		\$105				105		
APN-6 Spares		\$1,373		\$2,226				
							3,599	
GRAND TOTAL								\$15,027

Installation Data: Installation will be accomplished by a contractor turn around program.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: MK-46/Advance Light Weight Torpedo (ALWT) Presetter (OSIP 19-86)

Models of Aircraft Affected: SH-3H

Description/Justification:

This program will modify the existing SH-3 presetter. The new presetter will permit cockpit control of all mods of the MK-46 and EX-50 (ALWT) launch parameters. This modification includes an armament system control unit (ASCU) which will provide BITE and logic for all stores and release equipment. The MK-8 MOD 6 bomb shackle presently used for suspension and release of torpedoes on the SH-3H will be retained.

Development Status: Prototype circuitry of SH-3H torpedo presetter was installed and successfully tested on an SH-2 aircraft at NATC to provide MK-46 MOD 5 compatibility. Initial software/hardware design concepts have been formulated for ALWT compatibility at NAC Indianapolis. Approval for full production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	44	\$4,065	75	\$5,053	(75)	\$661	(22)	\$194	119	\$9,118
O&MN Install.				\$194						1,049
O&MN Training		\$105		\$261						366
APN-6 Spares		\$683		\$1,143						1,826
GRAND TOTAL										\$12,359

Installation will be accomplished by Naval Air Rework Facility (NARF) by Standard Depot Level Maintenance (SDLM) and Field Mod Teams (FMT).

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Conversion of T58-GE-10 Engines to T58-GE-402 (OSIP 56-86)

Models of Aircraft Affected: SH-3H

Description/Justification:

The SH-3H is underpowered and unable to hover at mission weight. The T58-GE-402 will provide an additional 100 shaft horsepower per engine. Installation of T58-GE-402 engines into the SH-3H will enable the aircraft to hover at a 1,000 pound higher weight (900F). The external configuration of the T58-GE-402 is identical to the T58-GE-10 except for the removal of the Power Management System (PMS) amplifier and installation of a new electrical harness. Engine mounting points, fuel control interface, fuel system connections, and electrical connections, are unchanged. Internal configuration changes are: Replacement of SEL steel first stage turbine buckets with Rene 80 (R80) steel; replacement of the aluminum power turbine ring seal with an INCONEL steel seal; relocation of P3 solenoid valve; and incorporation of a new gear bearing support and rotor shaft spacer. The engine fuel control is modified to remove PMS features, and to increase fuel flow. An accessory drive overspeed protection system (identical to the overspeed protection installed in VH-3D aircraft) is installed to prevent transmission damage in the case of engine malfunction/overspeed while in accessory drive.

Development Status: An equivalent engine (T58-GE-400B) is undergoing qualification for use in Executive Mission VH-3D helicopters. Qualification testing was completed in December 1983. No additional test cell qualification will be required. An installation evaluation flight test program to develop detailed aircraft flight data will be required.

OSIP 56-86

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5										
O&M Install.										
O&M Training										
APN-6 Spares										
		\$6,384		\$2,805		\$6,824		\$3,828		\$9,189
						\$78				10,652
										78
										794
GRAND TOTAL										\$20,713

Installation Data: Installation to be accomplished at Naval Air Rework Facilities (NARFs) North Island, and Cherry Point during Stannard Depot Level Maintenance (SDLM) and by Depot Field Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: EP-3 CILOP Program (OSIP 48-81)

Models of Aircraft Affected: P3-C

Description/Justification:

The EP-3E/B inventory of twelve (12) aircraft are early production P-3A aircraft which were converted to perform special VQ Electronic Warfare Support Measures (ESM) tactical support in near realtime to Fleet Operational Commanders. These obsolescent and old aircraft are deficient in that:

1. These high time and aging airframes are all closely approaching the end of their service life without major structural rework i.e., Service Life Extension Program (SLEP). Further, currently required maintenance due to airframe fatigue, corrosion and fuel leaks requires an inordinate expenditure of maintenance manhours per flight hour. The increased "downtime" for maintenance significantly affects operational availability of the available Aircraft Weapons System inventory.
2. The aircraft inventory (12) is comprised of three (3) different mission avionics configurations, EP-3E ARIES (3 ea.), EP-3E DEEPWELL (7 ea.) and EP-3R BATRACK (2 ea.), which adversely affects operational suitability/capability, maintenance costs per flight hour and the Integrated Logistics Support Program (Supply Support, required Maintenance Facilities/Equipment, Technical Publications and Training).
3. The EP-3 program initiated in FY 1967, and subject to many CILOP programs in subsequent years in order to meet rapidly Changing Electronic Order of Battle (EOB) requirements, has resulted in all aircraft configurations being both Weight and Balance critical.

OSIP 48-81

Description/Justification (Cont'd):

This CILOP modifies existing EP-3 aircraft COMINT/ELINT subsystems and then procures, installs and integrates common configuration Electronic Intelligence (ELINT) and Communications Intelligence (COMINT) subsystems into an EP-3 ESM Weapons System which will improve the Weapons System capability and one which will be a frame common to the P-3C ASW community and its worldwide logistics support system. ELINT/COMINT operational capability and aircrew productivity will be significantly improved by system redesign/optimization and utilization of computer-aided control of subsystems to the maximum extent practicable. Production/installation will be preceded by subsystems/system integration tests prior to installation in the prototype aircraft to ensure integrity of system design engineering and maximum attainment of specified Operational Requirements (OR) goals. The CILOP will (1) provide the systems engineering required to integrate and install an optimized ESM Mission Avionics configuration (Receivers, Recorders, Display Subsystems, Signal Analyzers and peripheral subsystems) in the P-3C aircraft utilizing existing EP-3E/B GFE Mission Avionics Equipments to the maximum extent practicable, (2) procure additional CFE/GFE equipments as required to attain the required EP-3 common configuration baseline, (3) procure, integrate and provide Fleet Satellite Communications (FLTSATCOM) capability, (4) procure Engineering Data documenting the new and standard configuration, and (5) provide ILSP elements (Technical Publications, Training, Support Equipment, ILS Documentation and an augmented Spares/Repair Parts inventory) as required to support the EP-3 Weapons Systems.

Development Status: Not applicable in that equipment(s) and subsystems to be installed are currently installed in EP-3E/B Weapons Systems except for FLTSATCOM subsystem. SATCOM equipments have completed development/test requirements.

Project Financial Plan:

	FY 1983		FY 1984		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$25,273	1	\$45,727	1	\$38,531	2	\$34,653	2	\$19,709
O&MN Install.					(1)	\$2,404	(1)	\$1,661	(2)	\$3,323
O&MN GOVT ILS						\$945		\$1,175		\$700
O&MN Contr. ILS						\$2,000		\$1,500		\$535
O&MN Training						\$275		\$90		\$90
APN-6 Spares						\$4,530		\$4,965		\$7,042

OSIP 48-81

Project Financial Plan (Cont'd):

	FY 1989		FY 1990		FY 1991		FY 1992		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$20,657	2	\$21,249	2	\$21,000		\$533	12	\$227,332
O&MN Install.	(2)	\$3,323	(2)	\$3,323	(2)	\$3,323	(2)	\$3,323		20,680
O&MN C/JT ILS		\$200								3,020
O&MN Contr. ILS		\$300								4,335
O&MN Training		\$90		\$90		\$90		\$90		815
APN-6 Spares		\$205		\$214		\$225				17,181
GRAND TOTAL										\$273,363

NOTE: \$15.67M of the FY 1983 total was authorized for COMINT/ELINT subsystem modification(s) to existing aircraft inventory.

Installation Data: Aircraft modifications will be accomplished by commercial contractor.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Infrared Detecting System (IRDS) (OSIP 57-72)

Models of Aircraft Affected: P-3A/B/C

Description/Justification

IRDS is an electro-optical surveillance system capable of recognizing and identifying surface targets including submarine periscopes and snorkels under nighttime conditions. The system consists of a night imaging sensor and associated electronics and display. Film and video recorders will be used in conjunction with the system. It will be capable of inflight recording and provide for inflight and postflight analysis. The IRDS installation displaces the KA-74 camera system. Therefore an optical window is being provided for the flight station escape hatch for use with a hand held camera. An auxiliary display is provided for the TACCO station in P-3C aircraft.

Development Status:

1. Interim IRDS - 11 Hughes GFE Systems for 66 Pod mounted P-3A/B/C aircraft, 4 Texas Instrument (TI) GFE Systems for 16 pod mounted P-3B aircraft. Production Hughes systems commenced delivery in December 1972. Flight test completed March 1973 with Hughes system. TI system commenced delivery in September 1975; flight test completed November 1975. Aircraft have been deployed with AN/AAR-37 and AN/AAR-40 systems.
2. Production AN/AAS-36 IRDS - 257 GFE systems planned for 290 nose mounted P-3A/B/C aircraft (144 P-3C, 146 P-3A/B). Production AN/AAS-36 IRDS commenced delivery in October 1978. Approval for service use (ASU) was received August 1979.
3. Video Tape Recorder (TRAC 1,000) requires no development and will be approved for full production by July 1986. This modification will affect 236 P-3C, 134 P-3A/B TACNAV Mod and 4 P-3B Special Project aircraft. The video recorder will be procured to match the quantity of IRDS sets stated above.



OSIP 57-72

Project Financial Plan:

	FY 1972		FY 1973		FY 1974		FY 1975		FY 1976		FY 1977		FY 1978		FY 1979		FY 1980		FY 1981		FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 Proc.	15	\$5,945			51	\$4,498	16	\$727																												
APN-5 Install.		\$5,945				\$4,498		\$727																												
Total APN-5			(11)	\$66	(9)	\$66	(34)	\$265	(24)	\$237	(4)																									
O&MN Install.																																				
APN-5 Proc.	12*	\$1,722	55**	\$13,247**	50	\$14,685	70	\$24,838	49	\$17,702	24***																									
APN-5 Install.	(12)	293	(42)	896	(36)	702			(51)	\$17,702																										
Total APN-5		\$2,015		\$14,143	(1)	\$15,387		\$24,838		\$3,636	(56)																									
O&MN Install.						\$30																														
O&MNR Install.																																				
APN-6 Soares				\$323		\$192				\$423																										
APN-5 Proc.																																				
APN-5 Install.	18	\$16,175	4	\$7,164	8	\$9,660		\$6,528	81	\$11,017	81	\$11,028																								
Total APN-5		\$16,175		\$7,164		\$9,660		\$6,528		\$11,017		\$11,028																								
O&MN Install.					(4)	\$385																														
O&MNR Install.	(27)	\$1,511	(19)	\$1,177	(14)	\$1,126	(27)	\$2,234																												
APN-6 Spares		\$9																																		

\*Includes one P-3C prototype with AAS-36.  
 \*\*Includes one P-3B prototype with AAS-36.  
 \*\*\*Includes one P-3A prototype with AAS-36.  
 @ Video recorder.

C/SIP 57-72

Project Financial Plan (Cont'd):

	FY 1989		FY 1990		FY 1991		FY 1992		FY 1993		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 Proc.											746	\$175,563
APN-5 Install.	81	\$11,559	81	\$12,115	50	\$1,876						1,891
Total APN-5		\$11,559		\$12,115		\$1,876						\$177,454
O&M Install.	(81)	\$2290	(81)	\$2290	(28)	\$990			(50)	\$1330		9,999
O&MNR Install.					(53)	\$1500	(81)	\$2290				6,483
APN-6 Spares		\$344										2,038
GRAND TOTAL												\$195,374

6 Video recorder.

Installation Data: Installation will be accomplished by Naval Air Rework Facility (NARF) and Contractor field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/AQA-7 Improvements (OSIP 84-79)

Models of Aircraft Affected: P-3B/C

Description/Justification:

This program will update the AQA-7 Acoustic Processing System by incorporating a Triple Vernier, DICASS and upgraded bearing computer. It has been demonstrated that a frequency Vernier greatly increases an acoustic sensor operator's recognition and classification capabilities. The DICASS capability provides long range, single sonobuoy targeting information which is essential for the fast moving submarine threat. This modification includes an update to the AQA-7 control panel and bearing computer for improved man/machine interface. An additional improvement provides a broadband processing capability compatible with existing sensors which will employ both cross correlating of two sonobuoy signals and auto-correlation of single sonobuoy signals. The Triple Vernier portion of this program is applicable to 167 P-3C (115 P-3C NUDS and 52 P-3C UD-I/II). The Triple Vernier Interactive Control Panel (ICP) and bearing computer is applicable to 223 P-3 aircraft (115 P-3 NUDS, 30 P-3C UD-I and 78 P-3C UD-II). The DICASS modification is applicable to 252 P-3 aircraft (115 P-3C NUDS, 85 P-3C UD-I/II, and 52 P-3B MOD). The broadband modification will affect 225 P-3 aircraft (115 P-3C NUDS, 30 P-3C UD-I, 80 P-3C UD-II).

Development Status: The Triple Vernier, DICASS, improved control panel and improved bearing computer represent corrections to deficiencies of functions already incorporated in the AQA-7 and do not require approval for service use (ASU). The AQA-7 received ASU in March 1977.

Project Financial Plan:

	FY 1979	FY 1980		FY 1981		FY 1982		FY 1983		FY 1984	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (3V/DICASS)	89/76	\$12,377	78/123	\$17,432		\$15,815	\$4,397	\$38,703	\$21,474		
O&MN Install.				\$1,738	\$11,177	\$9,174	\$7,898				
APN-6 Spares		\$900	\$3,828	\$2,635			\$1,810				

Project Financial Plan (Cont'd):

Installation Data: Installation of AFC kits will be accomplished by contractor field teams and organizational level. Component modification will be accomplished by factory turn-around program.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: P-3B Special Project Aircraft (OSIP 29-82)

Models of Aircraft Affected: P-3B

Description/Justification:

This modification replaces obsolescent equipment in four P-3B Special Project Aircraft by means of:

- a. Procurement of common Navy systems for increased capability, reduced operator workload and common logistics
- b. Installation and support of special mission equipment provided by Intelligence Agencies.
- c. Update of RF distribution hardware for selected intelligence gathering subsystems.
- d. Procurement of special mission equipment as directed by the Chief of Naval Operations.
- e. Conversion of interior and exterior of aircraft for operations in the 1990's.

Development Status: Approval for full production (AFP) is not required.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$3,400		\$2,873		\$1,653	1	\$5,121	1	\$5,527	1	\$5,806
O&MN Install.				\$1,562		\$1,724		\$3,477	(1)	\$2,071	(1)	\$6,571
APN-6 Spares								\$314				

OSIP 29-82

Project Financial Plan (Cont'd):

	FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$5,965		\$5,740		\$5,426	4	\$41,511
O&MN Install.	(1)	\$6,571	(1)	\$6,571				29,447
APN-5 Spares								314
GRAND TOTAL								\$71,272

Installation Data: Installations will be accomplished by drive-in Non at the Naval Air Rework Facility (NARF), the Naval Air Development Center (NADC), or contractor facilities.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: P-3C MAD System Integration (CSIP 31-82)

Models of Aircraft Affected: P-3C

Description/Justification:

This modification enhances the ASQ-81 magnetic anomaly detection (MAD) system on 155 P-3C aircraft by providing a compensation group adapter (CGA) for aircraft magnetic compensation. This modification also installs ASQ-81 MAD systems on 47 P-3C aircraft that are currently equipped with obsolescent ASQ-10 systems.

Development Status: Both the MAD CGA and the AN/ASQ-81 obtained approval for service use (ASU) in July 1979.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (CGA&IMP/ASQ-81)	45/0	\$2,333	73/0	\$3,415	37/15	\$6,423	0/22	\$7,500	9/10	\$3,583
O&MN Install.			(17/0)	\$1,471	(60/0)	\$4,260	(50/3)	\$4,581	(28/17)	\$6,877
APN-6 Spares		\$349		\$1,076		\$32				-0-

	FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5 (CGA&IMP/ASQ-81)					155/47	\$23,254
O&MN Install.	(C/22)	\$6,024	(0/5)	\$1,369		24,582
APN-6 Spares						1,457
GRAND TOTAL						\$49,293

Installation Data: The contractor will build and install CGA and MAD improvement kits via field team. ASQ-81 kits will be installed via drive-in modification at the contractor's facility.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ALR-66 ESM System (OSIP 48-83)

Models of Aircraft Affected: P-3B/C

Description/Justification:

The present P-3 electronic sensor monitoring (ESM) system is obsolete and lacks the required sensitivity, frequency coverage and bearing accuracy for threat warning. The ALR-66 is a current technology ESM system which will provide automatic indication of the bearing, range and classification of each threat radar transmission. The ALR-66 is designed so that its threat library can be updated at the organizational level without hardware modification. While 181 P-3C aircraft will have wiring provisions for this system, only 92 systems will be procured to support deployed HARPOON equipped aircraft. As the ALR-77 system enters the Fleet, all P-3C ALR-66(V)3 assets will be installed in Reserve P-3A/B aircraft. All ALR-66(V)2 Reserve assets will be upgraded to the ALR-66(V)3 configuration to provide the reserves with a total complement of A134 ALR-66(V)3 systems.

Development Status: P-3B ALR-66(V)2 received approval for full production (AFP) in October 1983. P-3C ALR-66(V)3 OPEVAL completed in December 1984 and AFP is anticipated in March 1985.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5										
O&M Install.		\$13,815	37	\$15,208	72	\$30,026	72	\$20,561	72	\$12,873
O&MNR Install.		\$995			(27)	\$1,593	(64)	\$3,899	(72)	\$4,337
APN-6 Spares		\$1,853		\$2,397		\$7,732		\$3,029		\$1,902



OSIP 48-83

Project Financial Plan (Cont'd):

	FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	62	\$12,518			315*	\$105,001		
O&MN Install.	(18)	\$1,095				10,924		
O&MNR Install.	(36)	\$2,124	(62)	\$3,547	(36)	\$2,124		
APN-6 Spares		\$1,896						18,809
GRAND TOTAL								\$143,524

\* Prior to FY 1983 WNO directed the procurement of 53 P-3B kits and 33 ALR-66 systems to support deployed forces.

Installation Data: Installation will be accomplished on-site by Naval Air Rework Facility (NARF) field teams for P-3B aircraft. Installation of P-3C kits will be accomplished by the contractor Field Mod Team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Update III (ASP) (OSIP 80-84)

Models or Aircraft Affected: P-3C

Description/Justification:

The Advanced Signal Processor (ASP) provides the Fleet with significantly improved ASW acoustic detection and classification capabilities which are essential for target prosecution in average and poor water conditions. This modification is especially critical in view of the minimum quantity of new Update III aircraft entering the P-3 Fleet. This program installs the ASP with associated receivers, displays and recorders into P-3C Update I (30 aircraft) P-3C Update II (80 aircraft) and P-3C nonupdated (115 aircraft). This acoustic update will provide a common configuration with Update III and is in compliance with NDCP #W0484-AS dated 23 June 1981.

Development Status: ASP received approval for limited production (ALP) in December 1983 and December 1984. Approval for full production (AFP) is expected by November 1985.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$24,231	9	\$56,901	15	\$94,032	26	\$166,717	27	\$173,233	39	\$265,461
O&MN Install.					(2)	\$1,479	(9)	\$6,654	(15)	\$11,088	(26)	\$19,220
APN-6 Spares		\$539		\$811		\$1,117		\$2,017		\$1,920		\$2,797

OSIP 80-84

Project Financial Plan (Cont'd):

	FY 1990		FY 1991		FY 1992		FY 1993		FY 1994		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	59	\$353,441	48	\$301,858							225	\$1,435,874
O&MN Install.	(27)	\$19,959	(39)	\$28,830	(45)	\$33,265	(44)	\$32,662	(18)	\$13,306		166,463
APN-6 Spares												9,201
GRAND TOTAL												\$1,611,538

Installation Data: Installation will be accomplished on-site by contractor field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: HF Simultaneous Operations (SIMOPS) (OSIP 82-84)

Models of Aircraft Affected: P-3C

Description/Justification:

The P-3C aircraft has two High Frequency (HF) radios installed. However, it is not possible to independently operate both radios in the transmit and receiver modes simultaneously due to the presence of radio frequency interferences. Each radio has the following communications modes: (1) voice, (2) teletype; and (3) data link. As presently configured, the aircraft can neither transmit simultaneously on both radios nor can it simultaneously receive voice or teletype while receiving data link communications. The lack of this capability severely restricts communications and limits the total integration of the P-3C in the Fleet Command, Control and Communications structure. The Fleet need for this capability has been documented by operational requirements from CINCLANT and CINCPAC. In addition, AN/ARC-161 reliability improvements are required to ensure adequate performance of the equipment with increased utilization. For the period ending July 1983, the AN/ARC-161 HF radio was number one on the P-3 Equipment Readiness Degradation Ranking (RISE). The receiver/transmitter unit, RT1100, has held the number one position for cannibalization removals since February 1983, and the RF amplifier, AM 6561 has recently risen to the number four position for cannibalization removals. The HF communication subsystem improvement will consist of: (1) modification of the currently installed AN/ARC-161 radio sets (2 per aircraft) to add radio frequency filtering to allow for simultaneous transmit and receive operation, (2) modification of the aircraft communications switching matrix, A-368, to allow utilization of both HF radio sets simultaneously and (3) modification of AM-6561/ARC-161 to improve CU-2070/ARC-161 functional interface and improve radio reliability. This modification affects 235 P-3C aircraft (115 NUDES, 30 Update I, 80 Update II, and 10 Update III).

Development Status: The AN/ARC-161 HF radio set is currently in production and is approved for full production on the P-3C aircraft. This modification to enable two radio sets to operate simultaneously is minor and approval for full production (AFP) is not required.

CSIP 82-84

Project Financial Plan:

	<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>		<u>FY 1988</u>		<u>FY 1989</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5		\$350	1	\$11,925	20	\$2,130	48	\$5,124	48	\$5,243	48	\$5,496
O&MN Install.					(1)	\$27	(20)	\$220	(48)	\$526	(48)	\$526
O&MN Training				\$275								
APN-6 Spares						\$198		\$98		\$78		

	<u>FY 1990</u>		<u>FY 1991</u>		<u>FY 1992</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	42	\$5,040	28	\$3,713			235	\$32,021
O&MN Install.	(48)	\$526	(42)	\$460	(28)	\$307		2,592
O&MN Training								275
APN-6 Spares								<u>374</u>
GRAND TOTAL								\$35,262

Installation Data: Installation will be accomplished by contractor field team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Solid State Synchrophaser (OSIP 57-86)

Models of Aircraft Affected: P-3A/B/C

Description/Justification:

The present P-3 engine vacuum tube synchrophaser is obsolete and becoming increasingly difficult to support. This OSIP provides a direct solid state replacement which will increase reliability and maintainability while reducing weight, prop noise, flight crew workload, and cost. This solid state replacement will eliminate the need for 20 minutes of stable flight presently required to adjust the prop phases when a propeller component is changed. 235 P-3C and 134 P-3A/B aircraft are affected by this change.

Development Status: Naval Air Test Center (NATC) verification of installation has been completed. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Ccost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	123	\$2,055	123	\$1,570	123	\$1,443	369	\$5,068
O&MN Install.		-0-						-0-
APN-6 Spares		\$234		\$242		\$215		691
GRAND TOTAL								\$5,759

Installation Data: Installation will be accomplished on-site by Navy Maintenance Personnel.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Survivability and Vulnerability (OSIP 59-86)

Models of Aircraft Affected: P-3C

Description/Justification:

A detailed P-3 Survivability/Vulnerability assessment defined radar cross section, infra-red and visual signatures and indicated a high probability of being hit by surface/sub-surface to air missiles and anti-aircraft gunfire in both the ASW and ASUW missions. The AN/ALQ-156 active missile detection system combined with the AN/ALE-39 infra-red flare and chaff dispenser will provide a self defense capability to counter infra-red and radar threats. The system will be programmed to automatically dispense IR flares, chaff or both, upon missile detection. The decision not to procure this self defense system will result in a high P-3 combat attrition rate.

Development Status: The AN/ALE-39 has Approval for Full Production (AFP) for a number of Navy platforms and will be extended to include the P-3. The AN/ALQ-56 is in full production for the U. S. Army. The P-3 installation of the AN/ALQ-156 and AN/ALE-39 will be verified by June 1985 with extension of AFP by August 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		FY 1991	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$3,358	48	\$13,502	48	\$14,088	48	\$14,572	48	\$15,074	43	\$12,853
O&M Install.					(1)	\$190	(48)	\$3,034	(48)	\$3,034	(48)	\$3,034
APN-6 Spares		\$194		\$1,947		\$2,052						

OSIP 50-86

Project Financial Plan (Cont'd):

	<u>FY 1992</u>		<u>FY 1993</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5						
O&MN Install.	(48)	\$3,034	(43)	\$2,718	236	\$73,447
APN-6 Spares						15,044
						<u>4,193</u>
GRAND TOTAL						\$92,684

Installation Data: Installation to be performed on site by contractor field teams.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: UHF/VHF Communications Update (OSIP 60-86)

Models of Aircraft Affected: P-3A/B/C

Description/Justification:

The P-3C has an operational requirement for UHF satellite communication via FLTSATCOM. In addition, the AN/ARC-101 VHF radio does not have 25 khz channel spacing capability required by International Air Traffic Control regulations and represents a potential safety-of-flight problem when operating with foreign air fields. The UHF and VHF radios (AN/ARC-143 and AN/ARC-101) suffer from considerable degraded performance because of crosstalk interference problems and lack the adjacent channel selectivity or internal intermodulation protection required for proper operation in today's operational environment. The AN/ARC-187 is a derivative of the AN/ARC-164 which is presently being utilized by the USAF and would correct the above mentioned UHF deficiencies. The AN/ARC-182 is the Navy's standard VHF radio for tactical aircraft and will correct the VHF deficiencies mentioned above and provide growth for ECCM capability. The VIR-31A will be utilized to provide the VHF navigation interface.

This modification would affect 236 P-3C aircraft (115 NUD, 30 UDI, 80 UDII, 11 UDIII) each having two AN/ARC-143 and one AN/ARC-101 radios replaced with two AN/ARC-187 radios and one AN/ARC-182 basic radio, respectively. In addition this modification will affect 139 P-3A/B reserve aircraft by replacing the single AN/ARC-101 radio with a single AN/ARC-182 basic radio.

Development Status: The AN/ARC-187 has received extension of Approval for Full Production (AFP) and only requires a verification of its installation in a P-3. The AN/ARC-182 has AFP and only requires a verification of its installation in a P-3.

OSIP 60-86

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		FY 1991	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	22	\$5,220	90	\$11,078	90	\$11,634	83	\$11,459	45	\$10,092	45	\$10,598
O&MN Install.					(11)	\$120	(45)	\$376	(45)	\$376	(45)	\$360
O&MNR Install.					(11)	\$88	(45)	\$360	(45)	\$360	(38)	\$304
APN-6 Spares		\$537		\$1,184		\$1,243						

	FY 1992		FY 1993		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	(45)	\$360	(45)	\$360	375	\$60,081
O&MN Install.						1,952
O&MNR Install.						1,112
APN-6 Spares						2,964
GRAND TOTAL						\$66,109

Installation Data: Installations will be accomplished by contractor field teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: FLIR Reliability Improvement (OSIP 102-7C)

Models of Aircraft Affected: S-3A

Description/Justification:

The Forward Looking Infrared (FLIR) system currently installed in the S-3A has consistently exhibited low reliability. This improvement will result in a FLIR installation which incorporates the major components currently installed in the P-3C and A-7 aircraft FLIR systems. These systems are currently exhibiting a reliability more than eight times higher than the present S-3A system mean time between failure (MTBF) of 320 hours versus 36 hours.

Development Status: All testing is complete.

Project Financial Plan:

	FY 1980		FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
O&MN Install.		\$822	5	\$1,859	12	\$5,084	15	\$4,746	10	\$2,738	50	\$13,035
O&MN Training					(5)*	\$100	(12)	\$232	(15)	\$405	(10)	\$283
APN-6 Spares				\$252		\$1,992		\$604		\$465		\$3,198

OSIP 102-79

Project Financial Plan (Cont'd):

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	30	\$7,287	36	\$7,914			168	\$48,486
O&MN Install.	(60)	\$1,498	(30)	\$1,284	(35)	\$966		4,768
O&MN Training								100
APN-6 Spares		\$1,883		\$3,679				<u>12,073</u>
GRAND TOTAL								\$65,427

\* Includes one prototype.

Installation Data: Installation will be accomplished by a contractor component update program.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Auxiliary Power Unit Increased Power (OSIP 106-82)

Models of Aircraft Affected: S-3A

Description/Justification:

This change consists of providing an Auxiliary Power Unit (APU) that will be capable of producing increased compressed air (20 ppm vice 48 ppm and 46 psia vice 32 psia at 130° ambient temperature) while simultaneously providing 45 KVA vice 2 KVA electrical power.

The increased air and power input will allow the S-3A avionics systems to be operated on the ground without dependence upon ground air conditioning or electric power for avionics maintenance and checkout. The present APU does not provide adequate cooling air to prevent avionics equipment damage from overheating during prolonged ground operation.

The increased electrical power will allow all aircraft electrical systems to be operated in flight after loss of an engine-driven generator, thus providing an additional operational and safety factor. This change will also result in a projected increase of the Mean Flight Hour Between Failure (MFBBF) to 200 hours versus the present 100 hours.

Development Status: This unit will be a derivative of the APU developed for the F-18 aircraft. Qualification tests for the F-18 APU have been completed. RDT&E, N Program Element Number 63210N and project number W1631 - A3 apply. Contractor tests and a Navv Technical evaluation were satisfactorily completed in March 1984. Qualification is by similarity.

OSIP 106-82

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$3,500		\$3,662	16	\$19,638	48	\$29,000	42	\$19,574	48	\$22,775
O&MN Install.							(16)	\$3,095	(48)	\$5,535	(42)	\$5,224
O&MN Install. Trainer						\$101		\$370				
O&MN Factory Training								\$525				
O&MN Interim Support												
APN-6 Spares						\$1,321		\$3,825		\$643		

	FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	(40)	\$5,288	(8)	\$1,013	154	\$ 98,149
O&MN Install.						20,155
O&MN Install. Trainer						471
O&MN Factory Training						525
O&MN Interim Support						643
APN-6 Spares						5,146
GRAND TOTAL						\$125,089

Installation Data: Installation will be accomplished by contractor field mod teams.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Display Generator Unit (DGU) Mod (OSIP 54-83)

Models of Aircraft Affected: S-3A

Description/Justification:

The Display Generator Unit (DGU) has consistently been a top 10 Readiness Improvement Summary Evaluation (RISE) item. Additionally, 1200 separate parts comprised of 27 individual parts were the subject of a 5-year protect buy in 1980 because of parts obsolescence in each DGU. A redesign is absolutely essential for supportability. The redesign effort, in addition to replacing the obsolescent parts, will provide a 500 percent improvement in reliability and correct existing maintainability problems. This would result in a proposed increase of the Mean Flight Hours Between Failure (MFHBF) from 41 hours to 250 hours.

Development Status: LORAL, the current supplier of the DGU, has under development for NAVAIR, an updated version of the DGU which has been designated a Universal Display Generator (UDG). The UDG completed Navy testing in the first quarter FY 1985. Approval for full production (AFP) is not required. An Airframe Change is required to install the modified unit.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$9,023	1	\$6,818	40	\$21,001	20	\$8,028	28	\$11,765
O&MN Install.							(41)	\$1,485	(20)	\$724
O&MN Trainer Install.								\$33		
O&MN Training								\$55		
APN-6 Spares						\$2,750		\$1,907		\$2,372

OSIP 54-83

Project Financial Plan (Cont'd):

	<u>FY 1988</u>		<u>FY 1989</u>		<u>FY 1990</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	34	\$14,790	17	\$7,395			140	\$78,820
O&MN Install.	(28)	\$1,014	(34)	\$1,292	(17)	\$646		5,161
O&MN Trainer Install.								33
O&MN Training								55
APN-6 Spares								<u>7,029</u>
GRAND TOTAL								\$91,098

Installation Data: Installation will be accomplished by contractor field mod teams.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ASA-82 Tactical Display System (OSIP 126-83)

Models of Aircraft Affected: S-3A

Description/Justification:

The Multi-Purpose Displays (MPD's) serve to display all tactical information to the flight crew members. Four common System Replaceable Assemblies (SRAs) in the four MPD's account for 40 percent of the MPD failures. Moreover, the MPD's utilize hybrid circuit technology and nine of the nineteen hybrids used in the MPD are currently obsolete. The remaining ten are projected to be obsolete within 5 years. The Aviation Supply Office purchased a 5-year protect buy of the nine obsolete components in FY 1980. An additional benefit will be an increase in Mean Flight Hour Between Failure (MHFBF) of these modified boards from 21 hours to 100 hours.

Development Status: The hybrid replacement candidates have all been identified with the program accelerated to FY 1983. Approval for full production (AFP) is not required. Loral will develop and provide these components with assistance from Naval Air Rework Facility (NARF) Alameda.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$250		\$3,235	25	\$7,900	120	\$6,674	115	\$6,989	60	\$5,220
O&MN Install.							(25)	\$549	(120)	\$2,798	(115)	\$1,646
O&MN Software						\$100						
APN-6 Spares						\$2,922		\$2,686		\$3,320		\$2,288

OSIP 126-83

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(60) \$1,317	320* \$30,268
O&MN Software		6,310
APN-6 Spares		100
		<u>11,216</u>
GRAND TOTAL		\$47,894

\* Quantity represents kits vice aircraft.

Installation Data: Installation will be by the vendor by a forced turn-around program at the vendor's facility.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: S-3A Weapon System Improvement Program (Redesignated S-3B) (OSIP 2-85)

Models of Aircraft Affected: S-3A

Description/Justification:

The S-3A Weapon System Improvement Program (WSIP), redesignated S-3B, will increase the effectiveness of the S-3A throughout its useful service life by providing improvements in detection, classification, localization, and attack capabilities.

NDCP WOH89-AS, approved by SECNAV in June 1981, authorized development of improved ASW capabilities to the S-3A through modifications to the acoustic, ESM and radar subsystems and the addition of ECM and Harpoon missile capability. Replacement of the present acoustic signal processor with the AN/UYS-1 will provide a substantial improvement in submarine detection and classification and is compatible with future advanced sonobuoys. Replacement of the sonobuoy receiver with the AN/AIR-78(V)2 and modification of the sonobuoy reference set will permit the use of the expanded sonobuoy RF coverage (from 31 to 99 channels). The radar modifications will permit earlier detection with an increased range presentation, provide an intermediate scan rate, and an Inverse Synthetic Aperture Radar (ISAR). ISAR capability will provide long range standoff identification of surface targets. The ESM system will be improved to increase its frequency coverage and bearing accuracy. HARPOON launch capability and chaff and flare dispensing for self defense will be added.

Development Status: DNSARC (milestone IIB) review occurred 24 February 1981. NDCP WOH89-AS Revision 1 was approved by SECNAV on 6 June 1981. The TEMP (No. 149-1) was approved by OPNAV on 10 September 1981. RDT&E,N Program Element Number 64217N applies. Major program milestones include the DT-IIB (January 1985) OT-IIA (February-March 1985), Approval for Limited Production (ALP) (June 1985), DT-IID (TECHEVAL) (October 1985-January 1986), OT-IIB (OPEVAL) (February-June 1986), and Approval for Full Production (AFP) (October 1986).

### Project Financial Plan:

Installation Data: The kits will be installed by contractor field teams at Navy facilities.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Right Hand Aft Avionics Rack (OSIP 82-85)

Models of Aircraft Affected: S-3A

Description/Justification:

The Switching Logic Unit (SLU) performs all switching of communications command, control, and information signals. Connector unseating caused by deflection of connector support beam and connector shells of the right aft avionics rack has been identified as a source of poor SLU performance. The Navy and Air Force are conducting a joint program to standardize rack design. A candidate design will mount to the existing aircraft shock mounts, will be form, fit, and functionally interchangeable with the existing rack, and meet Military Standards. Installation of this rack will solve the SLU performance and eliminate manhours required to reseat the SLU into its connector.

Development Status: A Joint Navy and Air Force program conducted preliminary testing and outlined the requirements for the new standardized rack. A prototype rack is installed in a test aircraft at the Naval Air Test Center, where operational evaluation and environmental testing will be accomplished. Two racks were installed at Naval Air Station (NAS) North Island for testing and evaluation and was completed in August 1984.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	25	\$1,036	85	\$3,020	50	\$1,880			160	\$6,836
O&MN Install.			(25)	\$110	(85)	\$373	(50)	\$219		702
APN-6 Spares		\$197		\$830						1,027
GRAND TOTAL										\$8,565

Installation Data: Installation will be accomplished by contractor field team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ICS Communications Control Group (OSIP 61-86)

Models of Aircraft Affected: S-3A, US-3P

Description/Justification:

The inter-communication system (ICS) communications control group presently installed in the S-3A has consistently been unreliable resulting in a high percentage of the aircraft being operationally degraded. These sets of equipment will be replaced by an ICS communication control group of new design. This new set will feature state-of-the-art large scale integration and microprocessor technology in place of the hard wired logic existing in the present set and will substantially reduce the number of components required to generate and process all of the communications signals. Application of current technology will result in significantly improved reliability and maintainability characteristics. This change is necessary to accommodate future changes such as the ARC-182 radio, JTIDS and the Global Positioning System (GPS). This change would result in a proposed system increase of the Mean Flight Hours Between Failure (MFHBF) to 100 hours from the present 15 hours.

Development Status: An Aeronautical Equipment Reliability Maintainability Improvement (AERMIPI) program for development of the new communication control group is in process at the Naval Air Development Center, Warminster, PA. Approval for Full Production (AFP) is expected in October 1985. RDT&E, N Program Element Number 25633N and project number W10-41 apply.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	10	\$9,394	26	\$11,414	40	\$14,308	21	\$7,636	49	\$15,311
O&MN Install. "O" Level		..0-								
O&MN Trainer Install.				\$66						
O&MN Factory Training				\$117						
APN-6 Spares		\$1,576		\$3,647						
										\$5,797

OSIP 61-86

Project Financial Plan (Cont'd):

	<u>FY 1991</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5	20	166
O&M Install. "O" Level	\$6,562	\$64,625
O&M Trainer Install.		-0-
O&M Factory Training		66
APN-6 Spaces		117
		<u>11,020</u>
GRAND TOTAL		\$75,828

Installation Data: Installation will be at organizational level.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: MK-46 Presetter Interface (OSIP 63-86)

Models of Aircraft Affected: S-3A

Description/Justification:

The S-3A has experienced some difficulty in consistently setting depths on the MK-46 Torpedo. Likewise, it is anticipated that a similar problem will occur for the Advanced Lightweight Torpedo. This program will resolve this operational discontinuity by modifying the bomb bay decoder. Due to the sensitivity of this subject, the justification of this modification is purposely brief.

Development Status: The contractor, in conjunction with Naval Avionics Center (NAC), has fully investigated the stated problems. The proposed solution is expected to be installed and verified four months after program commencement at Naval Air Station (NAS), North Island. An RDT&E contract was let in September 1984 to provide two flyable preproduction bomb bay decoders which will solve the MK-46 and MK-50C presetter interface problems. This program will be completed by the third quarter FY 1985. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$2,056	96	\$2,056	54	\$1,417		\$110	160	\$5,529
O&MN Install.					(96)	\$110	(64)			220
O&MN Trainer Install.						\$4				4
APN-6 Spares				\$809		\$568				1,377
GRAND TOTAL										\$7,130

Installation Data: Installation will be accomplished by a contractor field team.



**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: Off Line On Top Position Indicator (OTPI) (OSIP 64-86)

Models of Aircraft Affected: S-3A

Description/Justification:

The S-3 presently uses a derivative of the on-line Sonobuoy Reference System (SRS) to individually locate sonobuoys. The sonobuoy positions are computer generated and is not based on Radio Frequency (RF) energy. On-station sonobuoy field swaps are common and require immediate capability to locate sonobuoys of interest. The current system has a Mean Time Between Failure (MTBF) of 125 hours and is susceptible to two different single point failure cases. With failure of the SRS the use of the S-3 as an acoustic ASW platform is non-existent. The addition of this modification (1,100-hours MTBF in P-3C) would significantly contribute to ASW mission capability, provide an alternative to low MTBF item and could improve Full Mission Capable (FMC) rates by as much as three percent.

Development Status: Current development is underway for the Australian Air Force's P-3C aircraft by Hazeltine Corporation using the APR-78 99 channel receiver and a new control panel for sonobuoy location. This developmental process applies directly to S-3 configuration changes which will incorporate the ARR-78. Approval for Full Production (AFP) is not required.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1	\$3,139	40	\$2,808	62	\$4,044	37	\$2,854	20	\$1,701
O&MN Install.					(41)	\$458	(62)	\$680	(37)	\$406
O&MN Trainer Install.				\$190		\$283				
O&MN Training				\$26						
APN-6 Spares				\$1,067		\$1,601		\$1,026		

OSIP 64-86

Project Financial Plan (Cont'd):

	<u>FY 1991</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(20) \$230	160 \$15,066
O&MN Trainer Install.		1,774
O&MN Training		473
APN-6 Spares		26
		<u>3,694</u>
GRAND TOTAL		\$21,033

Installation Data: Changes will be incorporated concurrently with the S-3B by contractor field team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Passive Detection System Improvements (PDS) (OSIP 49-82)

Models of Aircraft Affected: E-2C

Description/Justification:

Changes in the nature of the threat, since the Passive Detection System (PDS) (ALR-59) was designed, and Fleet experience with the operator workload for the present configuration, require increasing the capability of the memory and making internal changes in one Weapon Replaceable Assembly (WRA). These changes will allow the following additional functions: (a) Special Pulse Penetration Interval (PRI) modulation detection, (b) automatic scan rate measurement, and (c) passive emitter location. Software changes will be needed in the PDS program as well as in the E-2C central computer (L-304) program.

Development Status: The contract has been executed for incorporation of the improvements in production E-2C Aircraft #69 which was delivered in February 1982.

Project Financial Plan:

	FY 1982		FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	9	\$9,355	9	\$9,030	12	\$9,617	12	\$10,930	12	\$10,342	6	\$5,435
O&M Install.			(3)	\$988	(7)	\$2,846	(9)	\$3,753	(12)	\$4,924	(12)	\$4,924
APN-6 Spares		\$1,672		\$3,913						-0-		

OSIP 49-82

Project Financial Plan (Cont'd):

	<u>FY 1988</u>	<u>FY 1989</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5			
O&MN Install.	(12)	\$4,924	60 \$54,709
APN-6 Spares		(5) \$2,873	25,232
			<u>5,585</u>
GRAND TOTAL			\$85,526

Installation Data: Installation will be accomplished by a contractor mod team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: TRAC-A (Weapon Improvement) (OSIP 64-83)

Models of Aircraft Affected: E-2C

Description/Justification:

The sidelobes of a radar antenna permit jamming signals to enter the receiver and reduce the range of target detection. As jamming power increases through advances in technology; the threat to operational use of the radar increases. Since the radar in an E-2C is its primary detection capability, a jammer is its principal threat. The TRAC-A is a new antenna and associated interfacing hardware for the radar which will permit the E-2C to keep pace with the jamming threat. Production incorporation aircraft #80 will have the complete installation. Aircraft #'s 78 and 79 will have interface hardware only. Kits marked \* include antennas for those two aircraft kits. This program modifies the E-2C aircraft by installing two ECP's:

- (a) ECP-300 installs the new antenna and an 8 channel rotary joint.
- (b) ECP-306 installs two additional side lobe jammer cancellers.

Development Status: RDT&E, N Program Element Number 24152N refers to the new antenna (ECP-300) only. DT IV and OT IV conducted in May and June 1982 resulted in continued production. These changes were incorporated in FY 1982 production aircraft #A-80.

OSIP 64-83

Project Financial Plan:

	<u>FY 1983</u>		<u>FY 1984</u>		<u>FY 1985</u>		<u>FY 1986</u>		<u>FY 1987</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	9*	\$24,834	11**	\$26,004	12	\$30,073	12	\$33,522	12	\$35,080
O&MN Install.					(6)	\$787	(12)	\$1,452	(12)	\$1,452
APN-6 Spares		\$4,952		\$1,208		\$1,841		\$1,812		\$1,829
APN-5	11	\$33,864								
O&MN Install.	(12)	\$1,452	(12)	\$1,452	(12)	\$1,452	(1)	\$121		
APN-6 Spares		\$2,096								
GRAND TOTAL									67	\$183,377
										8,168
										13,738
										\$205,283

- \* 6 each ECP-306 kits, 9 each new radomes.
- \*\* 11 each ECP-306 kits, 10 each new domes.

Installation Data: Installation will be accomplished at the contractor's plant.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: ARC-182 Combination Radio (OSIP 27-84)

Models of Aircraft Affected: E-2C

Description/Justification:

The AN/ARC-182 combination radio is a new radio for most tactical aircraft. It provides VHF-FM (30-88MHz), VHF-FM (108-156MHz), VHF-AM/FM (156-174MHz) and UHF-AM/FM (225-400MHz) secureable voice communications. Navy Decision Coordinating Paper W0661-CC approved the combination radio AN/ARC-182 for tactical aircraft, including E-2 aircraft.

Development Status: The radio is being developed under RDT&E, N Program Element Number 24163N, Project W0661CC. Approval for Full Production (AFP) was granted in the second quarter of FY 1984. Production effectivity is aircraft #104, the last aircraft of the FY 1984 buy scheduled for delivery February 1986.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	5	\$2,917	20	\$8,275	20	\$8,726	20	\$9,170	18	\$8,654
O&MN Install.					(5)	\$765	(20)	\$2,467	(20)	\$2,467
O&MN Trainer								\$684		
APN-6 Spares				\$1,342		\$270				

OSIP 27-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>	<u>FY 1990</u>	<u>TOTAL</u>			
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>			
APN-5						
O&MN Install.	(20)	\$2,467	(18)	\$2,220	83	\$37,742
O&MN Trainer						10,386
APN-6 Spares						684
						<u>1,612</u>
GRAND TOTAL						\$50,424

Installation Data: Installation will be accomplished by contractor mod team, keyed to squadron deployments.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: E-2C Radar Update Group I (USIP 27-86)

Models of Aircraft Affected: E-2C

Description/Justification:

The jamming threat to a radar (ECCM) can be minimized by current antenna technology and/or receiver modifications. The TRAC-A antenna (the first major redesign in the 20-year history of the E-2 series) is now in limited production as the initial step in the evolution of countering a growing threat acknowledged in agreed to intelligence. ECCM capability programmed for FY-86 production aircraft provides receiver subsystem modifications. These changes will augment the reduced sidelobes of the antenna pattern (increase detection in jamming environment), provide automated cues to the operators on best radar mode for different jamming levels and provide directional information of the jamming source for intercept with battle group fighters. The update Group I also modifies existing radar WRA's which will improve surface surveillance capability by stabilizing target tracking symbology (track life) and improving position accuracy on surface targets under varying conditions of sea clutter. These modifications will also generate range ring test targets which indicate the probability of detection of specific size targets at specific ranges under the existing environmental conditions. Resulting data is conveyed to the Battle Group Commander via Link 11 which improves the accuracy of Over-The Horizon (OTH) targeting by friendly forces.

Development Status: Preproduction hardware is in final fabrication stage. Flight testing of brassboard proceeding on schedule. Navy Preliminary Evaluation (NPE) involving both DTE/OTE completed early September 1983. Flight testing continues through 1985 to verify readiness prior to release LLT funds for production.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		FY 1991	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5												
OSAN Install.												
APN-6 Spares												
		\$9,289	12	\$32,508	12	\$35,033	12	\$36,718	12	\$38,484	12	\$40,335
					(1)*	\$2,508	(12)	\$13,008	(12)	\$13,008	(12)	\$13,008
				\$9,103		\$8,719		\$9,180		\$7,697		\$8,067

\*Prototype

OSIP 27-86

Project Financial Plan (Cont'd):

	FY 1992		FY 1993		FY 1994		FY 1995		FY 1996		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	12	\$42,277	12	\$44,309	6	\$23,220					90	\$301,173
O&MN Install.	(12)	\$13,008	(12)	\$13,008	(12)	\$13,008	(12)	\$13,008	(6)	\$6,504		100,068
APN-6 Spares		\$8,455		\$8,862		\$5,418						65,541
GRAND TOTAL												\$466,782

Installation Data: Installation will be accomplished by a contractor mod team.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Aircrew Emergency Egress Survivability Modifications (OSIP 67-86)

Models of Aircraft Affected: E-2C

Description/Justification:

The existing E-2 aircraft torso harness/backpack/seat pan emergency gear configuration is bulky and makes crew egress through the forward equipment compartment to the exit door excessively difficult. Its illiter demand bailout oxygen system does not protect the user from toxic fumes during egress and does not provide adequate volume of oxygen to sustain life during egress and descent from high altitude. ECP-271 has been submitted to correct these problems by designing a backpack container into which all the emergency gear can be compactly stowed, eliminating the seat pan. A 50 cubic inch bailout bottle supplying 100% oxygen will be provided. The 28 foot parachute will be replaced with a 26 foot one. Seat modification will be needed to accommodate the revised oxygen and communication connections. The aircraft normal system will be modified to a 100% closed system, and the ICS lines from the aircraft junction boxes to the crew members' helmet/oxygen mask will be modified. Production incorporation is aircraft #105.

Development Status: The components are used in other aircraft modules. Packaging into a unique E-2C backpack will require engineering, to be funded by the E-2C production program.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	20	\$4,086	20	\$3,629	20	\$3,806	20	\$3,989	4	\$837
OMN Install.			(20)	\$1,156	(20)	\$1,156	(20)	\$1,156	(20)	\$1,156
APN-6 Spares		\$386		\$329		\$272				

OSIP 57-86

Project Financial Plan (Cont'd):

	<u>FY 1991</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5		
O&MN Install.	(4)	84
APN-6 Spares		\$16,347
		4,874
		<u>947</u>
GRAND TOTAL		\$22,168

Installation Data: Installation will be by contractor mod team, keyed to squadron deployment's.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Mission Avionics (OSIP 64-81)

Models of Aircraft Affected: EC-130G/Q

Description/Justification:

The Minimum Essential Emergency Communication Network (MEECN) Master Plan established the requirement to expand present capabilities of the strategic military communication network. This necessitates modification of the existing VERDIN receive and transmit terminal with the Enhanced VERDIN Processor (EVP), Enhanced VERDIN System (EVS), and modifications to the very low frequency (VLF) power amplifier (PA). New VLF processors will also improve reliability and maintainability and reduce the weight and volume substantially. Other improvements, such as expanded VERDIN battery life, replacement of the unreliable time standard clock, and hook-up of the channel one interface between VERDIN and the TACAMO message processor will greatly improve the overall capability and interoperability of the TACAMO VERDIN system.

Development Status: The EVP has completed prototype development and has passed all environmental, EMI, EMC and Tempest tests. The EVP is scheduled to complete OPEVAL in FY 1985. The EVS is under development at Rockwell International, Anaheim, with software development by Naval Ocean Systems Center. Power Amplifier equipment modification analyses are being conducted to determine the minimum modifications necessary to expand operation of the VLF PA and cooling system to 1600 baud. Provisional approval for service use (PASU) was granted in June 1980.

Project Financial Plan:

	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985		FY 1986	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$4,801		\$2,919		\$9,298		\$3,829		\$11,993		\$4,954
O&MN Install.										\$27		\$101
O&MN Training						\$75				\$372		
APN-6 Spares				\$786		\$361		\$924				

OSIP 60-81

Project Financial Plan (Cont'd):

	<u>FY 1987</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5		\$1,517	*	\$39,311
O&MN Install.		\$300		428
O&MN Training				447
APN-6 Spares				<u>2,071</u>
GRAND TOTAL				\$42,257

\*Total aircraft to be modified is 20.

Installation Data: Installation will be accomplished by the fleet for the EVP and by Contractor Field Team for the EVS.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: AN - Activity 5

Modification Title and No.: Avionics Systems Improvement Program (ASIP) Phase Two (OSIP 117-84)

Models of Aircraft Affected: C-130F, KC-130F, KC-130R

Description/Justification:

The proposed program will replace the old VHF communications and navigation equipment, TACAN ADF-206, and related wiring with modern equipment and wiring, and install direct air support center (DASC) provisions. The above changes remove old tube-type equipment and replace with new solid-state systems. These new systems enhance capability and reliability.

The installation of the DASC provisions will allow an AN/UHQ-3A to be operated from the aircraft.

Development Status: Developed and being procured on the new production KC-130T aircraft.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$3,992	6	\$1,273	21	\$4,864	21	\$4,932	11	\$2,709
O&M Install.				\$169	(2)	\$225	(5)	\$355	(19)	\$1,349
O&MTR Install.							(1)	\$71	(2)	\$142
APN-6 Spares				\$188		\$92				

OSIP 117-84

Project Financial Plan (Cont'd):

	<u>FY 1989</u>		<u>FY 1990</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5					61	\$17,770
O&MN Install.	(19)	\$1,349	(9)	\$639		4,086
O&MNR Install.	(2)	\$142	(2)	\$142		497
APN-6 Spares						280
GRAND TOTAL						\$22,633

Installation Data: Installation will be accomplished concurrent with commercial Standard Depot Level Maintenance (SDLM).  
Validation will be accomplished at Naval Air Rework Facility (NARF), Cherry Point.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Avionics System Improvement Program (ASIP) Phase III (OSIP 70-85)

Models of Aircraft Affected: C-130F, KC-130F, KC-130R

Description/Justification:

The existing C/KC-130F/R Aircraft are equipped with old vacuum tube electronics and early 1950s systems technology. These old systems are expensive to maintain in both money and manpower. This modification program will replace these old systems with new and current state-of-the-art equipment. Systems to be installed, changed or modified during this phase of the ASIP are as follows: (1) Solid State Propeller Synchronization, (2) Compass System, (3) HF Secure Voice Capability, (4) Combined Altitude Radar Altimeter (CARA), (5) Engine Instruments, (6) Flight Director, (7) Ground Proximity Warning System (GPWS), (8) Inter-communication Systems Improvement, (9) Microwave Landing System, (10) Autopilot Improvement. These improvements will provide a substantial increase in safety, reliability and maintainability.

Development Status: Development is complete with the exception of CARA which will complete development and obtain approval for full production (AFP) by the second quarter FY 1985. All other improvements contained in this OSIP, except microwave landing system, were incorporated into the KC-130T aircraft.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		FY 1988		FY 1989	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	2	\$5,513	12	\$5,062	17	\$5,968	18	\$6,275	10	\$3,654
O&MN Install.							(5)	\$636	(18)	\$2,291
O&MNR Install.									(3)	\$381
O&MN Training								\$496		\$105
APN-6 Spares		\$147		\$429						

OSIP 70-85

Project Financial Plan (Cont'd):

	FY 1990		FY 1991		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost
APN-5					59	\$26,472
O&MN Install.	(20)	\$2,546	(9)	\$1,146		6,619
O&MNR Install.	(3)	\$381	(1)	\$127		889
O&MN Training		\$52				1,055
APN-6 Spares						<u>1,157</u>
GRAND TOTAL						\$36,192

Installation Data: Installation will be accomplished concurrent with contractor Standard Depot Level Maintenance (SDLM).  
Validation will be accomplished at Naval Air Rework Facility (NARF), Cherry Point.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-167 and AN/AST-4 Pods (OSIP 119-83)

Models of Aircraft Affected: A-4, A-6, A-7

Description/Justification:

The AN/ALQ-167 Pod is an ECM device designed to work against U. S. Navy fighter radars to simulate threat defense ECM systems. The AN/AST-4 electronically simulates several types of threat anti-ship missile seeker systems. These podded devices were first introduced into the Fleet in 1980 and proved exceptionally useful in readine exercises.

This program provides for the procurement and initial support of additional quantities of these pods for use by VC squadrons and other Fleet units. The inventory objective for the AN/ALQ-167 is 96, there are currently 48. The AN/AST-4 inventory objective is 36 with 25 in the current inventory.

No aircraft modifications are required to use these pods.

Development Status: There are currently 48 AN/ALQ-167's and 25 AN/AST-4's in the inventory. Beginning in FY 1986, both of these systems will undergo improvements which will enable simulation of the current and near-term threats. The internal electronics only will be improved for the AN/ALQ-167. The AN/AST-4 will receive an upgraded transmitter and be integrated into a high-speed capable, carrier qualified pod. Improved production pods will be procured beginning in FY 1988. Approval for full production will not be required for these pod modifications. RDT&E, N Program Element No. 24575N applies.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		FY 1987	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$832		\$2,863		\$2,364		\$3,781		\$2,321
OMN Install.								-0-		
APN-6 Spares				\$500		\$670		\$362		\$276

OSIP 119-83

Project Financial Plan (Cont'd):

	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>TOTAL</u>
	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>	<u>Qty</u> <u>Cost</u>
APN-5				
O&MN Install.	\$3,629	\$4,213	\$3,374	\$23,377
APN-6 Spares	\$602	\$486	\$510	-0-
				<u>3,406</u>
GRAND TOTAL				\$26,783

Installation Data: No aircraft modifications required. These pods have been qualified on all applicable aircraft.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: FEWSG; Simulator Set, Countermeasures, AN/ALQ-170(V)2 (OSIP 14-85)

Models of Aircraft Affected: Various

Description/Justification:

Fleet Electronic Warfare Support Group (FEWSG) is a separate command under the administrative and operational control of CINCLANTFLT. It provides support, with organic resources to both Atlantic and Pacific Fleets. FEWSG is the nucleus of the Navy's "aggressor" (ORANGE) Force. It employs tactics, procedures, equipment vans, and the specially configured aircraft of VAQ-33/34 plus the two Navy NKC-135A aircraft to simulate various threats during TECHEVAL, OPEVAL, Fleet Readiness Exercises, and Fleet Operational Training. These aircraft are based at NAS, Key West (VAQ-33), and at the Pacific Missile Test Center, Point Mugu (VAQ-34).

As set forth in NDCP 0898-AA (FEWSG), a new series of missile simulators is required, to be mounted on high performance aircraft in order to simulate Antiship Missiles (ASM's) for Fleet exercises and training. Present systems simulate only older less complex threat missiles. New specific threat simulators and, equally important, simulators for non-specific threat categories are needed. Accordingly, a new series of ASM simulators is being designed for procurement for FEWSG aircraft.

This program provides for the procurement and initial support for a variant of the basic AN/ALQ-170(V)1 Countermeasures Simulator Set. Such a modified simulator would incorporate capability improvements and other state-of-the-art improvements which are needed to keep pace with new ASM threat data. Each variant expands the capability of the AN/ALQ-170 to cover one particular threat or family of threats. Major components of these variant simulators will be totally interchangeable with those of the basic AN/ALQ-170(V)1. In addition, the simulators will be compatible with the FEWSG aircraft which have been adapted to carry the AN/ALQ-170(V).

OSIP 14-85

Development Status: The AN/ALQ-170(V)2 is now under development and the follow-on variants will be derivatives of this program. The first variant EDM will undergo tests similar to those required prior to procurement of the basic AN/ALQ-170(V)1. These tests include: pod certification, which was accomplished during the fourth quarter FY 1982; environmental testing, which was accomplished in the first quarter FY 1984; EMI and ECM/ECCM lab testing, which will be completed in the second quarter FY 1985; and reliability evaluation/improvement tests followed by flight tests and evaluation, which will be accomplished in the second quarter FY 1985. Formal approval for full production (AFP) is not required since the equipment will see service only with FEWSG/VAQ-33/34. RDT&E Program Element Number 24575N applies.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$9,508		\$12,575		\$15,566	9*	\$37,649
O&MN Install.				-0-				-0-
APN-6 Spares		\$1,225		\$1,790		\$2,572		5,507
GRAND TOTAL								\$43,236

\* Simulators

Installation Data: The host aircraft are undergoing avion wiring changes under FY 1979-1983 projects and will not require further mod for this new pod.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: C-9 Service Standardization (OSIP 72-86)

Models of Aircraft Affected: C /DC-9

Description/justification:

The Navy's current inventory objective for C-9B aircraft is 29. To reach this inventory, objective acquisition programs are underway to procure used DC-9 aircraft and retrofit them to C-9B configuration. This program will provide standard TACAN, UHF/VHF radio cargo door/floor and other required changes.

Development Status: These changes are developed and installed in C-9B configured aircraft.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		FY 1989		FY 1990		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$3,279		\$5,379		\$5,884		\$3,058		\$3,992		\$21,592
O&MN Install.		\$655		\$1,075		\$1,176		\$611		\$798		4,315
APN-6 stores		\$92		\$102		\$112						306
GRAND TOTAL												\$27,213

Installation Data: Installation will be accomplished by contractor depot level maintenance.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity =

Modification Title and No.: Sea Water Actuated Release System (SEAWARS) (OSIP 96-83)

Models of Aircraft Affected: A-4, A-6, A-7, AV-8, F-4, RF-8, F-14, F-18, S-3, T-2

Description/Justification:

SEAWARS is a sensing and activation device that attaches to the current manual parachute fitting and provides automatic release upon immersion in sea water. SEAWARS will preclude parachute entanglement and water dragging which are major factors in several aircrew drownings per year.

Development Status: Approval for full production (AFP) was received in the fourth quarter of FY 1983.

Project Financial Plan:

	FY 1983		FY 1984		FY 1985		FY 1986		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	1,750	\$8,173	2,050	\$5,742	1,435	\$4,508	680	\$2,195	5,915*	\$20,618
O&MN Install. "O" & "I" Level								-0-		-0-
APN-6 Spares				\$253		\$404				757
GRAND TOTAL										\$21,375

\*Quantity represents kits.

Installation Data: Installation will be accomplished at organizational and intermediate levels.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: 30MM Gun Pod (OSIP 89-86)

Models of Aircraft Affected: Marine A-4 and F-4 Aircraft

Description/Justification:

This modification will procure 30MM Gun Pods to replace the existing 20MM Pods to increase attack capability against a variety of targets.

Development Status: The U.S. Air Force has developed this system for its F-4, F-15 and F-16 aircraft.

Project Financial Plan:

	FY 1986	TOTAL	
	Qty	Cost	Qty Cost
APN-5	196	\$11,000	196 \$11,000
O&MN Install.			-0-
APN-6 Spares			-0-
GRAND TOTAL			\$11,000

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Power Plant Changes

Models of Aircraft Affected: Various

Description/Justification:

This program improves aircraft flight safety, operational fleet readiness and reduces engine cost of ownership by incorporating approved power plant changes. Power plant changes are required throughout the aircraft service life as the engine ages and service time is accumulated. While this aging process is occurring offensive/defensive equipment is added, mission and/or tactics change and the aircraft system operates in different environments to meet the ever-changing threat. The Component Improvement Program (RDTE&N) develops and demonstrates engineering solutions to identified safety and operational readiness problems. This program takes the output of the CIP which is an Engineering Change Proposal and implements the problem solution through procurement of the power plant change retrofit kit and technical data. This program provides retrofit kits for all Navy and Marine aircraft engines and engine related hardware such as propellers, starters, generators, and transmissions.

Development Status: All engineering effort will be accomplished prior to procurement of kits.

Project Financial Plan:

	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>
Total APN-5	\$11,551	\$9,983	\$11,173	\$9,159	\$10,444
O&MN Install.	\$4,668	\$4,953	\$5,206	\$5,472	\$5,735
Manhours	133,600	133,600	133,600	133,600	133,600
APN-6 Spares	\$1,213	\$1,144	\$680	\$855	\$708

Power Plant Changes

Project Financial Plan (Cont'd):

	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>
Total APN-5	\$8,339	\$11,714	\$13,017	\$13,732	\$10,550
O&MN Install.	\$5,993	\$5,993	\$5,993	\$5,993	\$5,993
Manhours	133,600	133,600	133,600	133,600	133,600
APN-6 Spares	\$606	\$1,113	\$1,237	\$1,305	\$1,002

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Emergent Safety Requirements

Model of Aircraft Affected: Various

Description/Justification:

This item covers the procurement of kits to correct flight safety deficiencies. These deficiencies are unpredictable since they are revealed during actual operation of aircraft in the Fleet under diverse tactical and environmental conditions. These changes must have OPNAV authorization and will be reviewed by the NAVAIR Change Control Board.

Development Status: Not applicable.

Project Financial Plan:

	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>
APN-5	\$4,886	\$4,235	\$5,926	\$2,070	\$4,955
O&MNF Install.	\$450	\$477	\$501	\$527	\$515
O&MNF Install.	\$3,076	\$3,764	\$3,430	\$3,605	\$3,778
Manhours	\$2,888	\$00,000	100,000	100,000	100,000
APN-6 Spares	\$135	\$28	\$1,490	\$203	\$471

Emergent Safety Requirements

Project Financial Plan (Cont'd):

	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>
APN-5	\$4,334	\$6,859	\$8,882	\$9,520	\$6,870
O&MNR Install.	\$515	\$515	\$515	\$515	\$515
O&MN Install.	\$3,778	\$3,778	\$3,778	\$3,778	\$3,778
Manhours	100,000	100,000	100,000	100,000	100,000
APN-6 Spares	\$322	\$652	\$844	\$904	\$653

Installation Data: These kits will be installed during SDLM, at organizational or intermediate levels, by contractors, or by field mod teams.

**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALR-45F (OSIP 109-79)

Models of Aircraft Affected: A-4M, OA-4M, F-4S, RF-4B, A-7E, KA-6D, AV-8C

Description/Justification:

The CP-1293 computer (ALR-67) and IP-1276 azimuth display have been designed such that they are interchangeable with the electrical pulse analyzer and azimuth display of the AN/ALR-45 receiving set. This provides a reprogrammable analyzer, an alpha-numeric display of threat bearing and identification (I.D.), and interface capability with AN/ALQ-126B, AN/ALQ-162 and AN/ALQ-39.

Weight and space are the same as the ALR-45 pulse analyzer (22.5 pounds, 536 cubic inches) and the ALR-45F is a "drop-in" one for one replacement for the ALR-45.

Development Status: TECHEVAL and OPEVAL are completed and provisional approval for service use (PASU) was granted in May 1982. Sixty-five units were procured in FY 1982 for a cumulative total of 108. Approval for limited production (ALP) was granted in October 1983 for an additional 55 units. Approval for Full Production (AFP) for the A-7E aircraft is planned for the second quarter of FY 1985.

Project Financial Plan:

	FY 1981		FY 1982		FY 1983		FY 1984		FY 1985	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	43	\$19,011	6	\$13,135	55	\$11,296	50	\$8,968	96	\$23,605
O&MN Install. "O" Level										
O&MN Support										\$650
APN-6 Spares				\$1,850		\$1,110				

OSIP 109.79

Project Financial Plan (Cont'd):

	FY 1986		TOTAL	
	Qty	Cost	Qty	Cost
APN-5	72	\$18,411	381*	\$94,416
O&MN Install. "0" Level		-0-		-0-
O&MN Support		\$650		1,300
APN-6 Spares		-0-		<u>2,960</u>
GRAND TOTAL				\$98,676

\*Quantity represents GFE.

Installation Data: The ALR-67 GFE is a direct replacement for ALR-45 analyzer and display to be installed at the organizational level.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-126B (OSIP 110-79)

Models of Aircraft Affected: A-4M, A-6E, A-7E, F-4S, RF-4B, F/A-18, F-14, EA-6B, AV-8B/C

Description/Justification:

The AN/ALQ-126B is a self-protection jamming system designed to significantly improve reliability/maintainability and operational performance from its predecessor, the ALQ-126A. The ALQ-126B system consists of equipment design changes to improve maintainability and reliability while significantly improving effectiveness. These design changes will have a negligible effect on equipment size and weight and the ALQ-126B remains a "drop-in" replacement for the ALQ-126A. Production will reflect a one for one replacement of the AN/ALQ-126A.

Development Status: TECHEVAL and OPEVAL are completed and Provisional Approval for Service Use (PASU) was granted in August 1982. One hundred thirty-six units were procured in FY 1982. FOT&E in the F-14 aircraft has been conducted, and further testing in F/A-18, A-4 and AV-8B aircraft is planned in FY 1984/FY 1985. Sponsor program review of June 1983 granted Approval for Limited Production (ALP) for FY 1983 and FY 1984. Approval for Full Production (AFP) will be requested upon completion of follow-on tests. This is anticipated by the third quarter FY 1985.

Project Financial Plan:

	FY 1970		FY 1980		FY 1981		FY 1982		FY 1983	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5										
APN-6 Spares	4*	\$13,240		\$8,790		\$8,080	136*	\$82,124	263*	\$118,904
				\$137		\$71		\$6,268		\$17,764

\* GFE only.



OSIP 110-79

Project Financial Plan (Cont'd):

	FY 1984		FY 1985		FY 1986		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	233*	\$100,744			182*	\$75,053	131*	\$52,400	950*	\$459,335
O&MN Support				\$200		\$300				500
APN-6 Spares		\$14,486				-0-				38,726
GRAND TOTAL										\$498,561

\*GFE only.

Installation Data: The ALQ-126B is a direct replacement for the ALQ-126A.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APR-43 (OSIP 113-85)

Models of Aircraft Affected: A-4M, RF-4, A-7E, F-4S

Reason/Justification:

This OSIP buys all common equipment for several aircraft. Individual aircraft mods procure provisions for these equipments.

The AN/APR-43 is a radar/missile warning receiver which provides mission essential warning and direction finding for threat systems. The APR-43 augments and is fully integrated with the AN/ALR-45F. The system is a form factor replacement for the AN/ALR-50, and as such keeps airframe changes to a minimum.

Development Status: TECHVAL and OPEVAL have been completed in the A-7E. Approval for limited production (ALP) for 57 units was granted in October 1983. FCT&E is ongoing in the AV-8C and is planned for completion in mid FY 1985. Additional FOI&E will be carried out in the RF-4B and F-4S aircraft in FY 1985/FY 1986. Approval for Full Production (APP) for the A-7E aircraft is planned for the second quarter of FY 1985.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN:	93	\$18,321	103	\$29,875	51	\$17,728	247	\$65,924

NOTE: See OSIP's 26-79 (A-7E), 143-84 (RF-4), 67-85 (A-4M), and 39-86 (F-4S) for airframe provisions, O&M Installs, APN-6 and previous year procurements.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALR-67 Radar Receiving Set, Countermeasures (OSIP 114-85)

Models of Aircraft Affected: F/A-18, A-6E, F-14

Description/Justification:

This OSIP provides for the procurement of common equipment for the F/A-18, A-6E and F-14 aircraft. Provisions for the installation of this common equipment are contained in the respective aircraft OSIPs. See F/A-18 (OSIP 66-34), A-6E (OSIP 51-84), and F-14 (OSIP -88).

The AN/ALR-67 Radar Receiving Set, Countermeasures Warning and Control System is the radar and missile warning system in advanced tactical aircraft (F/A-18, A-6E and F-14). The AN/ALR-67 provides detection and direction finding (DF) over the entire RF spectrum of target tracking and missile control systems. It provides full hemispherical coverage in all platform installations. The AN/ALR-67 is a reprogrammable system incorporating a high intensity alpha-numeric azimuth display. The system is fully integrated, via the MIL-STD-1553 data buss, with other on-board EW equipments. The AN/ALR-67 provides significant improvements/enhancements in DF coverage, threat coverage and reliability/maintainability over equipments currently in use.

Development Status: Engineering development models have undergone reliability development test, environmental qualification test and TECHEVAL. Operational effectiveness testing in the A-6E is complete. OPEVAL will be conducted in the F/A-18 in the second quarter of FY 1985. Follow-on tests will be carried out in the A-6E and AV-8B in FY 1985. Testing in the F-14 is anticipated in FY 1986. Approval for Limited Production (ALP) for 163 units was granted in the second quarter of FY 1984. Approval for Full Production (AFP) will be requested upon completion of the majority of follow-on testing.

Project Financial Plan:

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**MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986**

Appropriation: APN - Activity 5

Modification Title and No.: AN/ALQ-162 Countermeasures Set (OSIP 115-85)

Models of Aircraft Affected: A-4M, RF-4B, F-4S, A-7E, AV-8

Description/Justification:

This OSIP provides for the procurement of common equipment for the A-4M, RF-4B, F-4S, A-7E and AV-8 aircraft. For the AV-8, the AN/ALQ-162 is an integral part of the AN/ALQ-164 pod. Provisions for the installation of this common equipment are contained in the respective aircraft OSIPs. See A-4M (OSIP 4-83), RF-4B (OSIP 128-84), F-4S (OSIP 40-86), and A-7E (OSIP 141-84).

The AN/ALQ-162 provides complementary CW jamming to the operational AN/ALQ-126B pulse jammer installed in tactical aircraft. The AN/ALQ-162 will accept threat handoff data from the AN/APR-43 Radar Warning Receiver and utilize a common transmit/receive antenna integral to the AN/APR-43 antenna assembly. The AN/ALQ-162 also provides a stand alone capability allowing for defensive electronic countermeasures in event of AN/APR-43 failure. The AN/ALQ-162 design is fully reprogrammable to handle future threat parameter changes. The AN/ALQ-162 provides a significant increase in survivability for Navy tactical aircraft against radar directed air defense weapons.

Development Status: Northrop Defense System Division is under contract and provided engineering development models in the second quarter of FY 1981 for test and evaluation. TEMP No. 593 supports Navy test and evaluation. The RDT and TECHEVAL are complete. Approval for limited production (ALP) is expected in the second quarter of FY 1985. RDT&E,N Program Element Number 64224N applies.

Project Financial Plan:

	FY 1985		FY 1986		FY 1987		TOTAL
	Qty	Cost	Qty	Cost	Qty	Cost	
APN-5	110	\$36,550	180	\$45,658	65	\$13,238	355 \$ 95,446
APN-6 Spares		\$5,438		-0-			5,438
<b>GRAND TOTAL</b>							<b>\$100,884</b>

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APR-39A(V)1 (OSIP 36-86)

Models of Aircraft Affected: AH-1J/H, UH-1N, CH-53A/D, RH-53D, CH-46E, MH-53E, OV-10A/D, HH-3A

Description/Justification:

The AN/APR-39A(V)1 consists of: (1) replacing the existing AN/APR-39(V); analog processor with a current generation digital processor, (2) replacing the existing AN/APR-39(V)1 receivers with new receivers and antennas which expand the frequency coverage into the millimeter wave region, and (3) replacing the existing cockpit control panel with a similar unit capable of handling increased power loads. The digital processor is required to provide threat signal discrimination, alpha numeric display and synthetic speech audio in order to reduce pilot workload in the nap-of-the-earth flight environment. The receiver and antenna update is required in order to provide warning of modern threat radars which are using the millimeter wave spectrum. The digital processor will interface with and display inputs from other aircraft sensors (laser, CW and missile warning sets); however, the existing cockpit control cannot power these devices and an updated panel is required. All replacement equipments will be form/fit compatible with existing aircraft configurations and no aircraft change kit is required.

Development Status: The AN/APR-39(V)1 is approved for full production and is being used on Marine Corps helicopters. The improvement program is a joint Army/Navy project with the Army as executive service. A joint memorandum of agreement details individual service responsibilities during the engineering development phase. Engineering development contract was awarded in October '82. Navy TECHEVAL/OPEVAL will be complete in the third quarter of FY 1985 followed by approval for Full Production (AFP) in the first quarter of FY 1986. A draft ACAT III TEMP is being prepared under RDT&E,N Program Element No. 63206N. The improved system has been given the nomenclature AN/APR-39A(V)1.

OSIP 36-85

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	218	\$13,345	304	\$10,310	233	\$6,974	855*	\$30,629
O&MN Install. "O" Level		-0-						-0-
O&MN Training		\$300						300
APN-6 Spares		\$1,787		\$2,433		\$1,173		5,393
GRAND TOTAL								\$36,322

\* GFE only.

Installation Data: No airframe change is required. GFE will be installed at the organizational maintenance level by squadron personnel.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: Standard Central Air Data Computer (SCADC) (OSIP 34-84)

Models of Aircraft Affected: EA-6A, EA-6B, KA-6D, A-6E, NEA-6B, F-4S, RF-4B, TC-4C, S-3

Description/Justification:

Current air data computers are impacting readiness of Navy aircraft due to low reliability, obsolescence and nonstandardization. To resolve this problem a standard digital air data converter (DADC) has been developed (NDOP W0572) to replace the following air data computers: CP-1106, CP-1051, CP-1005, CP-828, CP-953, CP-1085, and CP-1077. The SCADC is designed to be form, fit and function interchangeable with no airframe change required. In addition to being interoperable between aircraft, the mean flight hour between failure (MTBF) will be increased from the current 106 hours to 400 hours. The existing ground support equipment in recent testing, has been found inadequate and therefore new support equipment is necessary.

Development Status: Development was funded under the Avionics Components and Subsystems Program (AVCS) Program Element Number 64203N, W0572. Approval for full production (AFP) was received in September 1984.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5	24	\$1,937	183	\$11,037	284	\$13,296	377	\$16,260	868	\$43,120
O&MN Install. "O" Level						-0-				-0-
APN-6 Spares			\$997			\$1,839		\$3,089		5,925
GRAND TOTAL										\$49,045

Installation Data: Installation will be accomplished at the organizational level.



MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: AN/APX-76 for VF Aircraft (OSIP 129-84)

Models of Aircraft Affected: F-4, F-14

Description/Justification:

The AN/APX-76 interrogator was procured for the F-4 on a one-for-two basis and was not procured with early F-14 production aircraft. All F-14 and F-4 have installation provisions for the APX-76. This outfitting level has resulted in considerable readiness problems as cross-decking and cannibalization are required, no equipment is available for pre-deployment installation, no operator or maintenance training is possible, and the integrity of aircraft provisions is not maintained. This program procures additional equipment to outfit VF aircraft one-for-one.

Development Status: The AN/APX-76 is approved for full production.

Project Financial Plan:

	FY 1984		FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APH-5	51	\$2,183	50	\$2,436	43	\$2,093	50	\$2,515	50	\$2,637
C&MN Install. "O" Level						-0-				
APN-6 Spares						-0-				

OSIP 129-84

Project Financial Plan Cont'd):

	<u>FY 1989</u>		<u>TOTAL</u>	
	<u>Qty</u>	<u>Cost</u>	<u>Qty</u>	<u>Cost</u>
APN-5	36	\$1,990	280*	\$13,854
O&M Install. "O" Level				-0-
APN-6 Spares				-0-
GRAND TOTAL				\$13,854

\*Quantity represents GFE.

Installation Data: The equipment will be installed at the organizational level.

MODIFICATION OF AIRCRAFT  
FISCAL YEAR 1986

Appropriation: APN - Activity 5

Modification Title and No.: UHF Relay Pod (OSIP 87-86)

Models of Aircraft Affected: S-3, A-6, A-7

Description/Justification:

UHF relay pod provides near term, inter/intra battlegroup communications capability Operational Requirement #013-74-84 for this program specified a total of twelve pods under this program to include 3 pods plus spares pack-up kit per numbered fleet. Six pods were developed under RDT&E, N Program Element Number 24163N, and six additional to be procured under this OSIP.

Development Status: TE/CHEVAL will complete in the second quarter of FY 1985; OPEVAL is scheduled for the third quarter of FY 1985; and an Approval for Limited Production/Approval for Full Production (ALP/AFP) decision is expected by 1 October 1985.

Project Financial Plan:

	FY 1986		FY 1987		FY 1988		TOTAL	
	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
APN-5		\$3,333						\$3,333
OSIP Install.		\$444		\$444		\$444		1,332
APN-6 Spares		\$556						556
GRAND TOTAL								\$5,221

Installation Data: No installation is required. O&M/N installation funding cited is for Repair of Repairables (ROR) during interim support until depot is in place in FY 1989. AIR-410 ROR will fund.